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# BUCKET BRIGADE TO FLYING SQUADRON



HERBERT THEODORE JENNESS

KG 222















*Herbert P. Jenness.*

# BUCKET BRIGADE

TO

## FLYING SQUADRON

FIRE FIGHTING PAST AND PRESENT

BY

HERBERT T. JENNESS

BOSTON

GEO. H. ELLIS CO., 272 CONGRESS STREET

1909

NG 222



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CAMBRIDGE, MASS.

## PREFACE.

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There is perhaps no subject upon which the English-speaking people should be better informed or in which it should feel a greater pride than in the modern fire department; for, aside from the fact that so much of our protection and safety depends upon this great necessity, it is to the Anglo-Saxon race that the credit is due of producing successful devices for operating against fire.

There has been no attempt upon the part of the writer to furnish anything like a complete history, but simply to present in convenient form a narrative of the interesting and successful progress of the fire service. The general details, illustrations, and data have been accomplished through visits to about one hundred and twenty-five fire departments and through correspondence with over one hundred additional. A complete history of the advance of this great enterprise would require a bulky volume, yet an accurate condensation will be found herein. The writer sincerely trusts that the work will prove satisfactory as a volume of reference.



**BUCKET BRIGADE**  
TO  
**FLYING SQUADRON**



## CHAPTER I.

It is, indeed, a fascinating and glorious scene to see flames leaping and curling upward, varying in colors, blended with volumes of rolling dense smoke as a frontispiece, roaring and gorgeously floating along toward the sky as a background in an inspiring splendor more beautiful than a master of the brush could hope to equal. But, beautiful as are such thrilling occurrences, to prevent and overcome them is a perpetual study, requiring deep calculation.

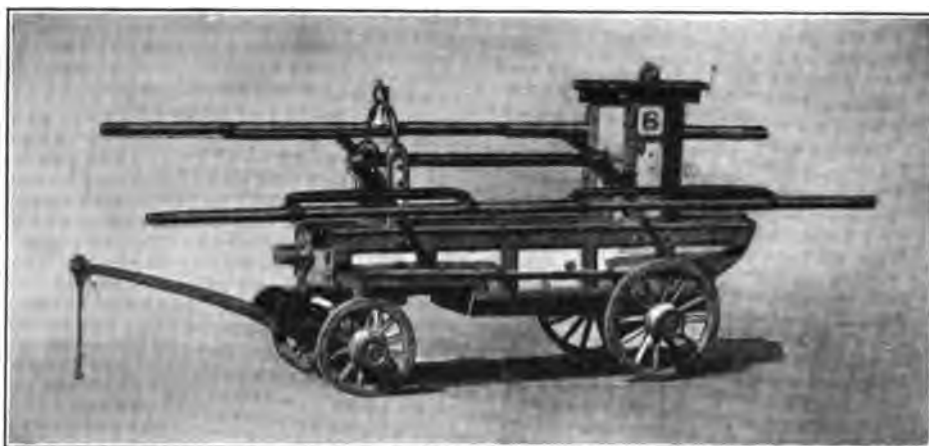
From "ye olden dayes," when the human voice was the sole means of conveying the dread warning that a blaze had broken out, and the neighbors went rushing with their buckets, until the present time, when an alarm sounded instantly (throughout an entire city) starts modern apparatus, drawn by trained horses or propelled by motor power, dashing along the streets, the mind of man has been constantly confronted with the ever-perplexing problem of successfully combating and subduing the life-destroying, property-destroying element—FIRE.

With the general enterprising advance of our large cities the modern fire department of to-day has grown to be like a standing army. Its recognized efficiency is as indispensable to the protection, safety, and prosperity of a city as is the regular army and navy of fighting men imperative to the stability, dignity, and integrity of a nation. The aim and purpose, however, of fire departments, are not to destroy, but to preserve.

The alertness, pluck, and efficiency which distinguish the officers and men of this great army the world over meet with well-earned recognition and praise, especially among the great race which thinks it better to arbitrate national differences by the dictates of logic, honor, and justice than to ravage by shot and shell upon the seas or to devastate property on land. While the English-speaking people have always been in the front rank of advancement, so also has the Anglo-Saxon brain been the quickest to devise means for protection against the elements, to subdue the forces of nature and convert them from enemies to friends. Englishmen and Americans began the modern fire department. The present age has developed and brought to an acme of success the original but improved-upon ideas. For centuries the best weapons that the people had for fighting the flames were nothing but water-bags, water-bombs, siphons, gigantic syringes, and inefficient pumps, sometimes dignified by the name of engines. Monstrous syringes, carried on low trucks, were used in England as early as 1590. In 1615 a hand-engine was made in Germany, which was merely a pump without hose of any kind. In 1667, immediately after the Great Fire, the city of London was divided into four fire districts with established

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officers having authority to take charge of the districts during a fire. About 1700 Van der Heide, of Amsterdam, invented a flexible hose, both for suction and as a substitute for the stationary goose-neck or pump nozzle with which a few of the so-called engines had been equipped. It was fifty years later, however, before this important invention became available and its actual worth established. About that time Richard Newsham, of England, built the first hand-engine that became of practical utility. Water was poured into the engine by hand and then pumped out through hose. Thus we begin to see the birth of the later well-known hand-engine which draughted its own water and thereby supplied the pumps. Time had taught Americans that their particularly inflammable homes demanded a better protection. Owing to the building of wooden and thatch chimneys, the first American fire ordinance was adopted in New York in 1648, forbidding their use and providing for the purchase of



OLD NEPTUNE NO. 6, PITTSFIELD, MASS., 1765.

ladders, hooks, and buckets. This ordinance provided for 150 leather buckets, which were distributed about the town. A body of men, purely from a spirit of public duty, patrolled the streets all night, on watch to discover fire. From their persistent and painstaking public spirit they were at once given the name of "Prowlers." Their efforts were fully appreciated, it would seem, for a few years later the town provided additional buckets, a number of short ladders, and hooks, when the number of "Prowlers" was also increased. There was, however, no official organization, the matter being individually voluntary. The first fire company governed by the ruling and mandate of civil authority was organized when the first engine to make its appearance in America was received by the "Towne of Boston" in 1678. The engine was imported from England, and a company was at once formed, which organization is generally conceded to be the first fire company in America. A few years later two of the Newsham engines were imported. In 1808 Messrs. Sellars & Penock, of Philadelphia,

nade the first riveted leather hose, and soon after an ingenious hose-carriage of American invention was adopted, and generally used for many years. Rubber hose was first imported from England in 1827, and is the foundation of our hose of the present day.

In 1829 George Braithwaite, of London, England, built the first steam fire-engine, foreshadowing the overthrow and disuse of the hand-engines in thickly populated districts. The first American-built steamer was built in New York,



FIRST STEAM FIRE-ENGINE, 1829



FIRST AMERICAN STEAM FIRE-ENGINE, 1840

in 1840, by Paul R. Hodges. The model, however, was not practical, and few steam fire-engines were built until about 1852. Captain John Ericson, however, built a steamer in New York about 1841 that could throw a stream through a  $2\frac{1}{2}$ -inch nozzle 166 feet into the air, drawing water through four lines of hose. A stationary boiler, from which hot water could be quickly transferred to the engine boiler, was kept in the engine-house, to quicken the making of steam, but the machine proved cumbersome, heavy, and expensive, and was discarded. In 1852 A. B. Latta, of Cincinnati, Ohio, built a steam fire-engine that could throw a stream 170 feet, and afterwards built another capable of throwing four streams 200 feet or six streams 175 feet through a  $\frac{7}{8}$ -inch nozzle. This engine weighed approximately nine tons, and required six horses to transport it with a speed that to-day would indeed be termed slow. The design was never fully completed. These two engines were followed by better models that proved so satisfactory that henceforth the hand-engine was gradually crowded out of favor for actual service in the larger communities. The "TUB," however, will always be remembered by the "old boys," who even to-day find pleasure in manning "an old defender" on a muster-field and hear the familiar "Jump her" and "Break her down."



A. B. LATT A ENGINE, 1852

The use of carbonic acid gas as a fire extinguisher is generally conceded to be of French origin. Various combinations of chemicals were tried, and even salt and water proved to be a good extinguisher, but to H. Phillips, an Englishman, seems to be due the credit of the important step of building a chemical

engine in 1844, with a fluid similar to the chemicals used to-day. In 1850 an improved Phillips engine was imported to America, At present there are several American-made chemical engines which are among the best in the world. Subsequent to the steam fire-engines various additions were made to the service,—fire-escapes of many designs, respirators for the firemen, swinging harness, fire-alarm telegraph, protective departments, fire-boats, water-towers, aerial ladders, high-pressure or direct pumping service, and last, but not least, the automobile, which is now being constructed to meet the various needs of conveying the modern inventions of fire apparatus. There is no authentic record from whence is the origin of the “hook and ladder truck,” although in the early days engines were often equipped with one or two ladders and with hooks and buckets. Many citizens also kept ladders of sufficient length in a convenient place for use about their own buildings. Factory owners very often had ladders permanently placed against their buildings and along the roofs, and also kept several large casks filled with water and a number of buckets. Such precaution was very often the means of preventing a serious fire, and was strongly significant of earnest citizenship.

## CHAPTER II.

It is the endeavor of all firemen to find every arrangement that will insure the application of water or chemicals upon a fire in its early stage. In most cases the beginning of a fire is small and its progress comparatively slow. Some of the great fires which for hours baffled the combined efforts of a large department, with its scores of determined firemen and a force of many powerful engines, could have been extinguished in a few seconds by the earnest and well-directed work of one cool-headed man with a single pail of water, had he arrived in time. Therefore, if ready means of suppressing a fire at its first beginning were at hand, many serious conflagrations might be averted. It is shown, then, that effective apparatus must be used and speed attained in conveying it to the scene of action.

Hence along this line we will follow the advancement.

In the days of the "buckets" the person discovering a fire ran to the nearest neighbor for help, and from one to another the alarm would be loudly given, and all started with their buckets. Arriving at the fire, they filled their buckets at the nearest well or brook, formed a line, and passed them along to the fire. A second line, often made up of women, would return the buckets to be refilled. Though but one or two stories high, with such loss of time and puny resistance, a building saved from ruin in those days was indeed a credit to the willing volunteers who performed the work. As buildings began to be constructed to a greater height and closer together, the people were quick to realize their almost helpless condition, and henceforth we find hand-engines. These were of the Newsham type of the year 1800. Hand-engines that draughted their own water supply through a suction hose were soon invented, and quickly took the place of the Newsham machine. About this time, instead of running from house to house to give the alarm, bells on the churches and public buildings were rung. The person discovering a fire would run to the nearest bell, and, when citizens in other parts of the town heard it, they rang bells there, and soon all the bells in the community were sounding the warning. Hearing the alarm, the firemen hurried to their fire-house, and, drawing out the rope, lined up on both sides, and started running in the direction of the sound of the first bell, dragging along their engine.

Arriving at the fire, the engine was placed by the nearest brook or reservoir, and the suction hose dropped into the water.

The hose-reel which was attached to the back of the engine was run off, and the hose laid to the burning structure.

The brakes (long handles), one on each side of the engine, were manned by

twenty \* or more men, who by pumping supplied and maintained a stream of water which the hosemen would direct upon the blaze.

At a fire where the water supply was at too great a distance for one engine to furnish an efficient stream, a second engine might be stationed between the fire and the reservoir, the first engine draughting and pumping water to the second, which pumped it to the fire. This arrangement very often caused a

lively contest. The men of the first engine would try their utmost to keep the second engine overflowed, while the men of that engine would return the compliment by striving hard to keep the first pumped dry.

Rivalry in outdoing one another waxed warm, "when we ran with the old 'masheen.'"

This form of fire service, with its improved engines and the remarkable quickness with which it reached fires (often running several miles), was highly commendable, and is effectively used in many villages and towns at the present time. Yet in cities where the growth of business demanded taller buildings for commercial use, and large warehouses were built, which contained various materials of a highly inflammable nature, the growing necessity for better fire protection proved the "old tub" to be inadequate.



"RED-SHIRTS." OLD TIME FIREMEN

Then came the steam engine with its hose-carriage, both drawn by horses, which marked the beginning of modern apparatus and increased speed.

The first models of the steam fire-engine were met by a friendly opposition from the sceptics, many of whom were jealous exponents of the "bone-and-muscle" system, and who jeeringly referred to the new invention as the steam squirt, kitchen stove, fizzing annihilator, or hydraulic nonentity. Since its introduction the "steamer," like all other new inventions, has passed through many important technical improvements, as the plates in Chapter VII. will confirm.

\* These companies often had forty or more members.

The latest of these engines can bid defiance to hour after hour of hard labor, and pump out water in quantities \* which seem well-nigh incredible. They are built in four or five sizes, ranging in weight from two and one-half to five tons, and have a discharging capacity of five hundred to thirteen hundred gallons of water per minute.

The larger and heavier style, known as the "horseless" (propelled by its own power), weighs from seven to nine tons and is capable of discharging fourteen hundred gallons of water a minute. The "horseless" is rarely sent out except in case of a large fire, when an enormous amount of water is required.

One of the first conveyances for carrying hose was a two-wheeled carriage with a revolving reel (or spool) hung between the wheels on which the hose was wound. Another model was a four-wheeled vehicle with the hose-reel resting on elevated arches. Both of these models were drawn by hand, and were often very elaborately designed and ornamented. The later makes were constructed to permit the use of horses, a seat for a driver, and a broad step at the back for the firemen to ride.

My earliest recollection of fire apparatus is a funny-looking, two-wheeled hose-carriage,† drawn by one horse, jumping and bounding along the street as it was driven in response to an alarm. It resembled a heavy sulky with a hose-reel attached.

Notwithstanding that a line of hose can be laid straighter and better from a reel, this style of hose-carriage, in most fire departments, has been supplanted by the modern hose-wagon, which, in addition to carrying a greater length of hose, is also useful as a temporary ambulance or despatch team. It is generally drawn by a pair of horses, and carries from eight to fifteen hundred feet of hose. Many of them are fitted with a framework on which one or two short ladders are carried.

With the steam engine and its hose tender ready for action, the need of a convenient and adequate water supply was apparent.

While several means of supplying a limited amount of water were in use in the ancient days, Rome, with its wealth and desire to outdo, seems to have taken the initial step toward the idea of the present public water service. As early as the year 97 B.C., Rome, it is claimed, possessed several aqueducts connected by a system of channels 268 miles long, of which about two hundred and twenty-eight miles were entirely underground and about forty miles above ground on a range of elevated arches. Like all other enterprises, the water service was given a large share of consideration, the outcome of which is visible nearly everywhere. New York City probably had the first water service that was connected for fire department use. A complete system of

\* The first time a certain individual saw a number of steam engines discharging their great quantities of water, he became astonished and excited, and with a knowing gesture remarked, "They will swallow all of our water supply."

There are instances where steam fire-engines have been constructed to be drawn by hand.

† "Supply hose," Cambridge, Mass.

underground pipes, constantly supplied with water by a central pumping station, was installed through the streets of Philadelphia and opened for public use September 15, 1815. The system proved a success, and has since become generally adopted, even many of the smallest towns being equipped with a public water service.

The fire department has access to this supply at hydrants placed short distances apart, and so fitted that an engine or hose can be speedily connected. There are two kinds of hydrants, the old style, concealed by a movable iron cover set flush with the street, and the "plug" or "post" hydrant in general use to-day.

With an abundance of water available, the next important step was to receive the quickest possible notification of the existence of a fire. To fill this requirement, the fire-alarm telegraph was evolved. The telegraphic fire alarm, originated by Dr. William F. Channing and Moses G. Farmer, was first installed in the city of Boston in 1852. It is considered one of the most important discoveries in the use of the electric telegraph. To install a fire-alarm system, a central station or battery room, in charge of an operator, is equipped with a series of wires, which extend to every part of the city and are divided into circuits.

Connected with these circuits, signal boxes, each bearing a number, are attached to buildings or poles. An alarm can be given from any of these boxes by opening the door and pulling down the hook inside. This starts certain clock-work mechanism which transmits the alarm to the central station, where it passes through an electric register, which clicks off the number and prints it on a tape. (There are other methods for receiving the number at the central station, but, the object being the same, the results are alike.) The operator, observing the number, instantly throws a heavy current of electricity on the proper circuit, and by pressing a button sounds the "box" in the fire-houses and on the public bells of the district. This manner of giving the alarm is principally used in the larger cities, where it is not deemed necessary to arouse the whole department unless needed. A repetition of the number, followed by successive alarms, would quickly concentrate the entire force. In small communities, with few boxes and infrequent fires, no permanent operator is employed, and the alarm is given to the fire-houses and bells direct from the box.

Another important step toward the general advancement was the building of long wagons, to carry ladders of the length required for tall buildings. The general construction of these trucks is similar to the earlier makes. They are commonly called "hook and ladder trucks," and many of them carry an aggregate length of three hundred and fifty to four hundred feet of ladders, with a number of long hooks for tearing down dangerous portions of roofs or walls and pulling over debris. With the use of these ladders, firemen can ascend with their hose to the windows of any floor of an ordinary building and do effective work. Fires occurred, however, where the heat and smoke made it

impossible for men to remain on ladders thrown against the walls of a building. Therefore, the need of something that could stay at all times, regardless of heat and smoke, was apparent.

The water-tower was then invented. In effect it is a movable standpipe which can be raised to a given height. New York City claims the first one, which was installed in the early '80s. Following this came the "Aërial Ladder," which is a water-tower and hook and ladder combined. The excellent work of the chemical engine was readily recognized, and its extensive use has greatly decreased the large losses formerly caused by water. A number of these engines constructed on automobiles are in use at present, and, owing to their great speed, this kind of a machine with its crew has been appropriately named, and is referred to as "Flying Squadron." High-speed "autos" for conveying the chief are already commonly used, showing the ultimate passing out of the familiar "chief's buggy."

The Protective Department, sometimes called Fire Patrol or Salvage Corps, is a valuable addition to the fire-fighting force, although generally it is in no way connected with the regular fire department. This department is maintained by the various fire insurance companies, and is governed by a board of fire underwriters.

Until the year 1873, notwithstanding the many improvements that had been made in the service, firemen were badly handicapped in making a quick response to an alarm on account of the necessary delay in harnessing the horses. Up to that time the horses were harnessed in the ordinary way, but during that year the intuitive mind of Mr. Charles E. Berry, a permanent engineer in the Cambridge (Mass.) Fire Department, conceived the important invention of the quick-locking hames and collar. This ingenious innovation reduced the time of leaving the fire-house, after an alarm had sounded, from a matter of minutes to one of seconds. These collars with their hanging harness, seen now in nearly all fire-houses, are of indispensable importance.

The "high-pressure" or "direct pumping system," which is being installed in nearly all large cities, was probably first introduced in the city of Rochester, N.Y., in the year 1874. Such systems generally use salt water (which cannot be used in the ordinary fire-engine), and is pumped from a central pumping station through special underground pipes and hydrants.

Before entering further into the details of the present improvements or upon the future improvement, let us give a little time to the effects of an alarm of fire to-day.

### CHAPTER III.

The various effects of an alarm of fire are best known to and their consequences appreciated by the man who is duty-bound to answer the call.

He must be prepared for sudden emergencies, prancing horses, suffocating smoke, raging flames, puffing engines, volumes of water, cracking and falling walls, explosions, excitement, fright, perhaps even death; his reward, a comfortable home or business block saved from ruin. The watchman of a large warehouse on the water front, in making his hourly round of inspection, discovers a fire in the rear of the building on the street floor, near an elevator. Frightened and with a look of horror, he runs to a near-by fire-alarm box, 52, located in

Square. He hurriedly opens the door and pulls down the hook, when the sound within tells him the alarm has been sent. It is nearly midnight, and the members of the nearest engine company, No. 7, are in bed, with the exception of the man on watch at the desk. The faithful horses are resting in their stalls, a single light is burning over the desk, the night watch is reading, while "'Rastus," a large pet cat, lies purring and playing with a pencil. Clang! (the man at the desk instantly starts) clang! clang! clang! clang! (5), a pause, clang! clang! (2), the gong in the fire-house strikes the number 5-2, and the location of the alarm is known. The horses are up in an instant, their stall doors fly open, and they clatter out, taking their places under the harness while the men are sliding down the poles. Click, click, click, and the collars are locked. Snap, snap, snap, and the reins are hooked. The "watch" yells out the number, the driver leaps to his seat, the captain and enginemen spring on behind, the doors swing open, and out dashes the engine, the hose-wagon closely following. The watchman grows impatient. It seems like an age since he sent the call, but in reality it is fifteen seconds, thirty seconds, one minute, and—but see, a few streets away, an engine drawn by three leaping steeds comes swinging around a corner, and heads for the square at a break-neck pace. Close behind comes the hose-wagon, with its brave crew dressing in rubber clothes and donning helmets, preparing for work. On they come like mad, the whistle on the engine shrieking and the bell on the hose-wagon ringing. Policemen run into the street to see that the way is clear. Motor-men stop their cars and cab-drivers rein in their horses to allow the apparatus to pass unobstructed. A faint glare of light begins to illumine the surroundings. The watchman is so absorbed in this inspiring and nerve-racking scene that he fails to see another engine, drawn by a pair of noble bays, swish around a corner above and make toward him at a startling rate. The hose-wagon, with a pair of black beauties, dashes along after the engine. With a series

of short shrieks and a whizzing sound the flying squadron arrives, and its men rush into the building with their extinguisher hose. A hook and ladder truck, rocking and swaying, is bounding along, and a little ahead a chemical engine is rapidly approaching, with a pair of handsome sorrels which seem to be running wild. An open carriage, drawn by a swiftly running horse, is bringing the district chief and his driver. A loud continuous whistle is heard, and from a wide avenue the glare of head-lights is seen fairly flying toward the box, and in a few seconds a chugging and snarling sound announces the arrival of the head chief, who leaps out of his auto (having ridden at a mile a minute clip), ready to take command. A water-tower arrives and is placed for action, then more engines with their hose-wagons, an aerial truck and protective company. A blast from the water front sounds the arrival of a fire-boat. All take position ready for work. The driver of the first engine, knowing the district well and directed by the watchman, drives his engine to the nearest hydrant. The hose-wagon comes up, the end of the hose is thrown to a man at the hydrant, and, as the driver urges his plunging horses on, the hose is laid to the front of the warehouse. The oily condition of the woodwork and the combustible materials stored inside have given the fire a terrific start. The flames are raging up the elevator well and invading each room with a mad roar. Burning brands have dropped to the bottom and set the cellar in flames. A police patrol wagon drives up with a sergeant and a dozen bluecoats, who proceed to keep back the collecting crowd of excited people. The captain of the engine company first to arrive is urging his men with words of encouragement through the dense smoke and stifling air, and they are sending an effective stream into the fire at the point where it was first discovered. The flames have reached the top of the elevator well and are spreading along the upper floor. "Truck-men" have placed ladders against the outside walls to each story, engine companies have mounted them, and entered with their hose. The chemical engine is at work, its hosemen are in on the street floor, battling persistently to prevent a portion of the flames from gaining an open stairway. Both chief and district chief are everywhere, directing the captains and keeping an eye on the safety of the men. A hospital ambulance with its surgeon and orderlies has reported to the chief and is stationed near by. The flames have broken through the roof, and are threatening an adjoining building. The heat in the upper stories is breaking the windows, and glass is falling around. The nozzle of the water-tower, on a level with the top floor, is pouring directly through a window a monster stream of water, supplied by the high-pressure service. The chief orders an aerial ladder to a driveway at one end of the building, and, even as it is being raised, men with hose are climbing it. At the shout "Play away," a strong stream shoots into the flames, which are curving out of the windows and further endangering the adjoining building. In the rear the fire-boat is sending many strong and effective streams into the back portions of the main fire. Ladders have been raised to buildings on both sides, and companies with

hose are on the roofs, directing their powerful "high-pressure" streams into the flames. The hosemen on one of the upper floors are suddenly interrupted in their flight by a thrilling sensation. A heavily charged electric light wire has broken, and is swinging around them. Many times they have attempted to cut off the wire, each time being repulsed, the wire sizzling and flashing a blinding blue glare into their eyes. At last they are successful, and again renew their endeavors against the fire. The district chief orders a stream to the cellar, laddermen break in the basement doors with axes, and the hosemen enter a dense smoke and intense heat through a shower of glass and burning embers, The heavy pressure of water forcing through their hose taxes their strength, but slowly they go on, the well-directed water gaining against the flames. They are driven back by a small avalanche of blazing wood and sparks which come with a crash down the elevator well. They turn their helmets back to the front to protect their faces from the frightful heat, and start in again. Three mild explosions check their advance and warn them of what to expect, but, undaunted, they remain at their work. It is a miracle they are not suffocated. The courageous men of the protective company are groping about the building, covering office furniture, merchandise, and valuable machinery. The want of air is having its serious effect on the brave crew in the cellar, for it is like a furnace. A "hot-air explosion" on the third floor renders a number of the hosemen unconscious, their uninjured comrades shout for aid, anxious firemen rush in, and tenderly bear the prostrate forms to the street, and deliver them to the care of the ambulance surgeon. A dread murmur suddenly comes from the onlookers at the driveway,—a back draft, or light explosion, drives out a heavy cloud of flame and smoke into the opening, enveloping the men on the aerial ladder. When it partially clears, the men are seen, still clinging to the ladder, grimly determined to conquer the task confronting them. Cheers rise from the collected throng in the street, but high up in their hazardous position the firemen appear oblivious to it. The combined forces, a "miniature Niagara" entering from all sides, are winning, the fire above is darkening, the men in the basement have won. Some of the companies have disconnected and started back to quarters. The chief and district chief, with a few men, are making an inspection, tearing off a board here and there to make sure no spark remains. The fire is out. The chief compliments the district chief on the efficiency of his division. The district chief praises his men, thanks the police, and sends in the all-out signal. The remaining companies make up and return to their stations. The owner, who was a witness, says. "I thought my building was doomed, but by speedy concentration of apparatus and brave men, with the ardent work of the protective company, the office is intact, the tools and machinery little damaged, and the building can be repaired at a comparatively small cost." The firemen, who were overcome on the third floor, have revived, and were back at the quarters when their company arrived, "waiting for the next call."

A carefully conducted investigation revealed the cause of the fire to be spontaneous combustion. While this chapter is intended to show the advanced working of a modern fire department, it also presents one of the most dangerous and mystifying causes of a number of our serious fires.

It is a well-established and accepted fact that the power of ignition inherent in animal and vegetable substances is often the cause of spontaneous combustion. The putrefaction of vegetables has been known to occasion the development of sufficient heat to sometimes cause their ignition. Cotton, shavings, and sawdust, hemp, flax, oily and greasy rags or rubbish, charcoal, turpentine, alcohol, paint materials, tarred rope, felt, phosphorus, sulphur, and saltpetre are susceptible to low degrees of heat and are often the cause of a fire. Factory owners and their employees, in short every one, should know that spontaneous combustion is seldom occasioned by accident, but is the outcome of carelessness and often direct negligence. Under many conditions it is as certain as is the explosion of gunpowder or other explosives when a spark is applied. The powder will not explode until the spark is furnished. A pile of oily rubbish forgotten, unnoticed, or neglected, to all appearances a harmless and innocent nothing, may take, slowly but surely from the oxygen of the air, the means of its own combustion, and kindle a blaze, or possible subsequent conflagration, in a factory crowded with operatives or a dwelling in which the inmates are locked in peaceful slumber. It is imperative that proper care should be maintained in disposing in time of all inflammable refuse matter. The analysis of fires from spontaneous combustion is of particular value to fire officials. They are often robbed of this important information, however, by a fire gaining such headway before discovered that all evidence of its origin is destroyed. Charcoal is considered to be one of the most dangerous combustibles, inasmuch as in a number of experiments it has proven so susceptible to heat that it has ignited at a temperature less than required to boil water, 212°. The temperature of a heap of fine charcoal, eight feet square and five feet deep, increased in three days from 58° to 92°, and at the end of the fifth day it had risen to 154°, and had taken fire in several places at the end of one week. A scientist once made the following accidental discoveries. A flask of damp gunpowder was laid flat on top of a stove to dry, and on top of the flask a small package of pulverized charcoal was placed. After a few minutes the paper was observed to be smoking, and upon examination it was found that the charcoal had taken fire and was slowly being consumed. During this time the gunpowder remained on the stove unexploded. Another experiment which was tried a number of times was the placing of a pan of water and a lump of charcoal on the top of a cylinder stove. In each test the charcoal took fire (and in two instances was reduced to ashes) before the water reached the boiling-point. The practical working side of this experiment, and one which has been of value to firemen, proves that wood under or around a stove, heater, or defective chimney, might by continued heating become like charcoal and sooner or later take fire. In

such cases the woodwork is generally covered by iron, zinc, or tin plating, preventing a fire from burning out. Therefore, it might work upward or inward to a space beneath the floor or between the walls, where, assisted by more air, it would rapidly spread about the building, and, when discovered, would be breaking out in several places. Owing to the difficulty in locating and subduing these blind partition fires, the results are invariably disastrous. While the above shows the extremely combustible nature of charcoal, it is also a reasonable example of the unseen causes attributed to spontaneous combustion, and should make plain the need of exercising proper care and foresight by doing all things possible to prevent such occurrences. Too much care cannot be taken in our endeavor to overcome the possibility of such causes. That an ounce of prevention is worth a pound of cure fits this subject admirably.

## CHAPTER IV.

In Rome, about the year 46 B.C., Julius Cæsar had nearly completed the construction of the "Basilica Julia" (a magnificent law courts building) when it was almost destroyed by fire. After the assassination of Cæsar in the year 44 B.C. Augustus completed the structure as Cæsar had intended, and even after all these years the platform still remains, a relic of architectural antiquity and of a serious fire of ancient history. In the year 64 A.D. Rome was nearly destroyed by a fire which burned for several days, and, had it not been for the humane "Nero" (the self-constituted ruler), who provided shelter and food for the stricken people, their suffering would have been pitiful. Some writers have placed the cause of this fire upon Nero himself, but authentic history refutes the accusation. Much has been written regarding this fire, both on account of its severity and because of its occurrence in the days of unknown fire protection.

The great London Fire of 1666 burned over 436 acres of ground, consuming 13,200 houses, the ancient cathedral of St. Paul, eighty-six churches, the Royal Exchange, Custom-house, hospitals, libraries, and four prisons in which several persons lost their lives. The total loss was nearly sixty millions of dollars. This terrific conflagration, following close upon the plague which was brought to England from India and from which nearly one hundred thousand mortalities occurred during the year 1665, left London in a truly devastated condition, although the fire proved a blessing, inasmuch as the life-destroying pestilence had been burned out. The fire started on Sunday night, September 2, in a bake-shop on Pudding Lane, after a very dry spring and summer; and the little wooden houses, with pitch coverings and without party walls, made excellent fuel for the furious flames. Raging for three days, this fire in its ravages triumphed over the most formidable and stately structures of the time, destroying them with the apparent ease that it did the small wooden dwellings in which it started. Having burned to the water front and the abating of a high east wind that had been blowing a gale, this fire, one of the earliest of the world's great conflagrations, was finally conquered.

Previous to the year 1795 "the towne of Boston," now so flourishing a city of science, culture, and enterprise, was visited by a score of fires so extensive in their destruction and frightful in desolation as to be selected, and the details preserved, for records of history. The distressing calamities which had come to Boston from destructive fires induced the people to make the prevention of fire, and the relief of sufferers thereof, one of their first objects of charity and philanthropy. The rapid growth of the town, with its closely built dwellings

and warehouses constructed almost exclusively of wood, placed it in a position particularly exposed to conflagration. As early as 1653 a fire destroyed several buildings in which a number of people lost their lives. This is known as Boston's first great fire. On November 27, 1676, another fire, caused by the dropping of a lighted candle, consumed forty-six dwellings and business buildings, including a church. It burned the district between Richmond, Clark, and Hanover Streets to the bay. Much more area would have been burned over, had not a heavy fall of rain come during the progress of the fire. August 7, 1678, at midnight a fire broke out at the dock (now Dock Square), and burned along the wharves, consuming eighty dwellings and seventy stores with a number of vessels, entailing a loss of over a million dollars. The next great fire happened in March, 1702, breaking out again near the dock, and its advance was checked by blowing up three warehouses with gunpowder.

The real "great" fire of the time, however, took place in October, 1711, when the historic "Towne" House and Meeting House, with all the buildings on Cornhill, King (now State Street) and Queen Streets, were levelled to the ground. Many of the buildings destroyed in this fire were of the best and largest of the day, and the loss of historical connections, as well as financial destruction, was enormous. The fire was started by a woman picking over a pile of oakum by candle-light. Some twenty lives were lost by the blowing up of buildings, the persons killed venturing too far in their efforts to save articles of historic value. Boston continued to have serious fires, but the next "great" calamity came in March, 1760, when a fire started on Cornhill, and raged through King Street to the wharves, destroying 349 dwellings, stores, warehouses, etc., causing a loss of over a million dollars. In January, 1761, Faneuil Hall and a number of stores were destroyed, and on April 20, 1787, a fire on Beach Street consumed a hundred buildings. July 7, 1824, a number of handsome residences along Beacon, Charles, and Chestnut Streets were laid in ruin. The great square between Doane, Kilby, Batterymarch, and Broad Streets was entirely burned on April 7, 1825. Many other fires have occurred in Boston, among the later being the Church Street district in 1845, when hundreds of families were rendered homeless; the Blackstone Street fire, destroying fifty buildings in 1835; and the East Boston fire on July 4, 1861.

The "Great Boston Fire" began Saturday night, November 9, 1872, at seven o'clock, and many are still living who were eye-witnesses to that destructive conflagration. That fire, caused by a spark whose life could have been smothered between the thumb and finger, was the largest this world has ever known, with the exception of Chicago in 1871 and San Francisco in 1906. The flames started in a large and solid block at the corner of Summer and Kingston Streets, which was occupied by a wholesale dry-goods concern and hoop-skirt manufacturers. The fireman of the building had banked his fires for the night, taking the usual precaution, but a spark had snapped out and lodged against a board nailed to the wall near the boiler which furnished the steam for oper-

ating an elevator. The board caught fire, and the flames spread rapidly up the elevator well to every floor, giving them a terrific headway before being discovered. In the destruction that followed sixty-five acres of solidly built edifices along street after street were burned over, entailing a loss of about eighty millions of dollars. The burned territory was the centre of business, and the largest and most substantial buildings were among those ruined. Luckily, only about one hundred dwellings were burned, making the total number of persons rendered homeless somewhat less than a thousand. Too many, indeed, but few compared with the results of other large fires. The vast loss fell almost entirely upon the wealthy merchants, to whom the credit of rebuilding and beautifying the burned district is due. About eight hundred buildings were destroyed, either burned or blown up to check the spread of the flames. The known loss of life is twelve, although a long list of missing is yet unaccounted for. Several firemen were killed outright, and many bodies were recovered from the ruins. The fire burned for three days, and was constantly under a strong militia guard, which co-operated so finely with the police department that remarkable law and order was maintained at all times. Much delay was unavoidably occasioned, owing to a general distemper that had previously broken out among the equine forces, necessitating many engines ordinarily drawn by horses to be propelled to the scene of the fire by manual labor. This delay, and the terrible headway which the fire had gained before the arrival of a large force of apparatus and men, were largely responsible for the terrible results that followed. Yet to John R. Damrell, the fire chief of Boston at that time, and to the volunteer officers of a number of surrounding departments, who willingly gave their aid, this fire will always remain recorded as one of the best "extinguishments" among the world's great fire-scares.

The last conflagration that visited Boston began on Thanksgiving morning, Nov. 28, 1889, causing a loss of \$3,681,670. The fire started in the building occupied by the Woonsocket Rubber Co., and, before being subdued, had destroyed fourteen buildings and damaged forty more, and cost the lives of five firemen.

Boston with its long list of peculiarly unfortunate encounters with the fire-fiend appears to the writer to be reasonably entitled to take precedence among the suffering subjects of great fires. Many of her sister cities have suffered, and, when the eyes of the nation have been tear-dimmed by terrible holocausts, Boston has always been among the first to extend generous aid and substantial assistance. New York, Washington, Chicago, St. John, N.B., Portland, Pittsburg, Lynn, Baltimore, San Francisco, Chelsea, and other cities have been liberally aided in times of disaster. Much praise can also be given them for their assistance to Boston in her days of trouble.

Such bonds of sympathy and friendship are a wholesome example. "We dwell together in unity," cities as well as men.

A great fire broke out in New York, December 16, 1835, and consumed six

hundred buildings, reaching a loss of over twenty million dollars. A high wind, the extreme cold weather, and very narrow streets were largely responsible for the large loss. Under these trying conditions the firemen worked most heroically, and many were forced to seek temporary treatment to allay their suffering from the cold. A number of the fire-engines became so coated with ice that they were rendered unfit for service, and this further hampered the good work of the department. Many thousands of people were rendered homeless, resulting in aggravated distress and suffering.

The "big" Chicago Fire broke out Sunday night, nine o'clock, October 8, 1871, and was caused by a cow kicking over a lamp in a stable at the corner of DeKoven and 12th Streets. The flames quickly consumed the stable, spread to adjoining property, and before being extinguished destroyed 17,500 buildings, at a loss of nearly two hundred million dollars, besides leaving homeless over eighty thousand people. The fire raged for three days and nights, laying waste hotels, banks, public buildings, newspaper offices, business blocks, railroad stations, water-works, gas-works, several churches, and thousands of dwellings, covering in all 2,100 acres. Over one hundred persons lost their lives.

The first of the great fires in the United States occurred in Pittsburg, Penn., April 10, 1845, and from a careless custom, yet a simple cause. A Mrs. Ziegler built a fire in the back yard of her home on Ferry Street to heat water for her washing. A high wind blew sparks to a building, which quickly ignited, and in a short time a \$5,000,000 blaze had been kindled. The destruction ceased only when no material was left for the fire to feed upon in a territory of fifty-six acres, in which nearly two thousand families were burned out.

The fire of Portland, Me., in 1866, destroyed 1,800 buildings, rendered homeless ten thousand people, and, involving a loss of \$15,000,000, raged for sixteen hours with terrific fury, and destroyed buildings covering over two hundred acres in the heart of the city. This fire, the most destructive that had ever occurred in America up to that date, started on the afternoon of the Fourth of July, and was caused by an over-ambitious patriotic celebrant throwing a fire-cracker into a boat-builder's shop on Commercial Street.

The Baltimore (Md.) fire in 1904, which burned over a hundred and forty acres of elegant business buildings, reaching a loss of about sixty million dollars; and the San Francisco conflagration of 1906, brought on by an earthquake, which destroyed over twenty-eight thousand buildings, covering 2,700 acres of ground, rendering homeless over two hundred and sixty thousand people, causing a total loss of nearly four hundred million dollars,—are of so recent occurrence and were so beautifully described by the press throughout the country that no further description seems necessary at this time by the writer.

From the effects of too rigid laws, apparently in the wrong direction, the city of Constantinople has had many exciting encounters with fire. "GREAT FIRE IN CONSTANTINOPLE!" was for years a frequent head-line in the European press. While it would seem that these accounts might be to some extent

exaggerated, it is known, however, that up to a comparatively recent date Constantinople suffered more devastating fires, with greater loss of life, than any other city in the world. History tells of a great fire as early as 465 A.D. In 1729 twelve thousand buildings were burned and seven thousand persons perished. In 1745 a fire broke out and burned eight days, and in 1749 ten thousand buildings and many lives were lost. Every few years, fires broke out, and seemed to burn at will, for in 1756 fifteen thousand buildings were consumed with a loss of one hundred persons; and in 1769 and 1778 other large fires, with large losses of life, occurred. This seemingly incredible record continued until 1791, when over thirty thousand houses were destroyed with a loss of over one hundred millions. Again in 1831, 1848, 1867, and in 1870 the city suffered from large fires, destroying in nearly every instance thousands of buildings with a loss of many millions. It is generally conceded that the people of Constantinople dare not try to put out fires starting in their homes for fear of officers appointed for that purpose, who alone have the authority to extinguish a blaze. Little wonder, then, this continued succession of disasters! The buildings were small, and in many instances a fire could have been easily extinguished, had the law been less stringent.

St. John, N.B., has had its share of great fires, and many of them brought ruin and desolation. The first occurred on June 18, 1784, and burned eleven dwellings, which were the houses of discharged English soldiers who had served during the Revolutionary War. Here an amusing incident may be noted of General Benedict Arnold, of Revolutionary fame. In 1788 a serious fire destroyed most of Arnold's business block in St. John. Arnold's partner charged him with a knowledge of setting the fire, for which Arnold brought a suit for slander and received a verdict of twenty shillings. On January 13, 1837, with snow-covered ground and bitter cold weather a fire destroyed 115 houses and many business blocks, bringing a complete loss of over one million dollars. This fire, coming in midwinter, caused untold suffering, and many horrified mothers with their small children were exposed for hours to the severe weather. With the physical suffering a financial discomfort was also keenly felt, for, lacking faith in the companies, hardly a family was insured.

The real "great" fire of St. John started June 20, 1877, and many people still living recall with vivid memory the ruin, fright, and deaths. On twenty-one streets, with an aggregate length of ten miles, every building was consumed. Two-fifths of the city, covering 290 acres of ground, was burned over, and at one time two other sections of the city were on fire, caused by flying burning brands. 2,780 families, occupying two thousand dwellings, were made homeless, and eighteen persons perished. The loss was \$15,000,000. St. John was not a wealthy city, and the result was much harder to bear than that of other cities, even where fire losses had been many times greater. To-day a loss in this fire is in many ways referred to as the cause of individual slow progress and business trouble.

Moscow in Russia had the peculiar fate of having been burned several times during international struggles, and might indeed be a shining example for General Sherman's definition of war. In the year 1237, when Moscow had hardly recovered from famine and pestilence, the Tartars under Batou, after a bloody and victorious conflict, entered and burned the city. In 1383, two years after the historical battle on the banks of the Don, in which one hundred thousand Tartars were killed, they again made entrance into Moscow, burned the city, and put to the sword twenty-four thousand persons, who were fleeing from the flames. When Napoleon with the French army won the battle of Borodino on September 5, 1812 (one of the most desperate struggles in the annals of war), he moved into Moscow on September 14 and 15, and was astounded to meet no resistance and to find the city deserted. He placed his army in comfortable houses, and established himself in the Kremlin, the ancient palace of the Czars. During the night of the 15th he was alarmed by the breaking out of fire, which was with much difficulty finally overcome. The following night flames burst forth again in several localities, starting a fire which raged for five days, and left barren nine-tenths of the city, in which were consumed seven thousand buildings, thereby leaving Napoleon and his army without shelter and at the mercy of the bitter winter weather. The subsequent retreat of the French army from Moscow, and their intense suffering, is oft-told history. The fire was the direct work of the Russians. Rostopchin, the governor, personally fired his own mansion and stables, having previously withdrawn his army and most of the inhabitants to surrounding cities and towns for safety. He ordered the prisons opened, sent away the fire-engines, and previous to setting fire to his own estate distributed torches among the people and ordered other buildings ignited. Rostopchin, content with inflaming the spirits of Napoleon and his men, said in effect, "I would rather destroy the city than have an invading army enjoy possession while my own people suffered privation." This description, although trenching upon the memoirs of war, is intended to illustrate the exposure, misery, devastation, and general deplorable results that can be reached while the powerful element of fire holds sway.

Many forest fires have despoiled prosperous settlements, and reduced to a barren waste a great extent of territory. As an example of these fires, that which took place along the banks of the "Miramichi" in New Brunswick is noteworthy. On October 7, 1825, this terrific fire destroyed nearly six thousand square miles of forest land, besides consuming over seven hundred buildings and about one thousand horses and cattle. It started in the wooded regions about Nashwaak, the flaming hurricane sweeping out the whole heart of the province from the waters of the Miramichi to the shores of Bay Chaleur. Scattered over the interior were lonely pioneer families, and many lumbermen, for whom there was no refuge from this ocean of raging flame, and in that single night nearly two hundred persons were consumed by fire or drowned in the

Miramichi, where they had sought shelter from the frightful heat. The heaviest sufferers were the inhabitants of Newcastle and Douglastown. The destruction of vegetation was so thorough that even to this day there are vast tracts in the burnt region where nothing grows but stunted shrubbery. The property loss was one and a quarter million dollars, and to standing timber the estimated loss was two and one-half millions.

During the fall of 1871 the States of Wisconsin, Minnesota, and Michigan suffered from forest fires, which often laid waste many square miles and consumed entire villages. In Wisconsin alone fifteen hundred persons perished from these quick-spreading fires. The annual loss to standing timber by forest fires amounts to several million dollars. In recent years the State of Maine has had a number of fires which have involved large financial losses both to personal property and standing timber. Several of these fires have been proven to be of incendiary origin, and forcibly bring to attention the enormity of this form of crime. That the mind of any person should be contaminated with a desire to place life and property in jeopardy, either from an uncontrollable passion for pyrotechnics, thrilling scenes, or revenge, is a condition to be truly lamented. The great loss resulting from fires and the magnitude of destruction and injury caused by them should be a lesson sufficient to repel any one from a crime so full of horrifying and wasteful possibilities. We see and know the deplorable ending of too many devastating scenes to have any mercy for the evil-doer who, from a malicious intention, starts a fire. There were at one time more than a score of convicts in the State prison at Charlestown, Mass., sent there for the crime of arson. Trial for such crime is generally certain and the punishment severe. In many countries, death has always been the penalty for such criminals. In ancient Rome, where at one time this crime had become very common, an exceptionally strong law was enacted which speedily diminished the number of this class of offenders. Any one found guilty of setting a fire would be burned to death by being placed in a sack which had been covered with pitch and other oily substances, which, when set on fire, gave the criminal no possible chance of escape. After the fire in Boston of 1779 a Frenchman, who had been suspected of starting it and who was unable to establish his innocence, was obliged to surrender a bond of "five hundred pounds sterling," and was further punished by having both ears cut off, standing two hours in the pillory, and charged with all the costs of the prosecution. In 1681 a negress who had been convicted of setting fire to two houses, which caused a young lady to perish, was punished by being publicly burned to death.

From the first sound of the fire bell (either for a false alarm or for a conflagration) until the all-out signal is given, the firemen responding and the people in their haste to make a clear path for the rushing apparatus are for a time placed in an increased danger. Therefore, the influence of any punishment, no matter how severely imposed, for the malicious setting of fires or for giving a false alarm, is conducive to better security to the general populace.

## CHELSEA FIRE

### CHAPTER V.

Closely following the sad echoes of the distress of sufferers who had been rendered houseless, homeless, penniless, by the terrible fires in San Francisco and Baltimore, Chelsea, a handsome city and suburb of New England's metropolis, was visited by a devastating conflagration, which for severity, character, and destructiveness finds its parallel only in the crushing disasters of New York in 1835, Chicago in 1871, and San Francisco in 1906. The residents and merchants, who were located upon the pretty and substantial streets which have risen through years of toil by slow yet steady advancement, have all shared the common fate contingent upon this dread catastrophe. All have the same melancholy tale to tell,—“We have been burned out.”

On Sunday morning, April 12, when thousands of the inhabitants of Chelsea arose, to enjoy the quiet and rest anticipated at the end of their six days' toil, little, indeed, was their thought that ere that day's sun should set their business blocks of granite, brick, and iron, and their costly and comfortable homes, their hospitals, schools, city buildings, banks, churches, post-office, and State Armory, would be a mass of smoking cinders, ashes, and ruin. But the fire-fiend was abroad again, and most mercilessly did he wield his powers for destruction through scores of closely builded streets, and before nightfall millions of dollars worth of handsome buildings, with their merchandise and personal property, had been devoured by the frightful element of fire, which raged without check so continuously throughout that fatal “Sabbath Day.”

From a business view the loss, Heaven knows, was heavy enough, but the individual distress and complete loss among families and the poor of the city was heart-rending in the extreme; and years must elapse before many of the sufferers can, in the ordinary course of events, recover from the dreadful effects of that wholesale work of the Fire King. Whole blocks of brick and iron melted away before the raging fury of the dreaded element, and stately residences fell one after another, like so many paper structures, when the fire fairly got under way. Everything that human effort could do to check or stop it in its lightning-like course of devastation proved for hours unavailing, and only when an army of firemen with their apparatus from surrounding cities and towns was concentrated against the fire did anything effective appear to arrest the progress of the rushing flames, which devoured alike new and old buildings in its track of merciless destruction.

The fire started about 11 A.M. in one of the buildings of the Boston Blacking

Works, off Summer Street, near the Everett line, and so rapidly did the flames travel that it seemed as if three or four fires broke out simultaneously and close together. The entire fire department responded with splendid promptness, and in a remarkably short time a score of streams were pouring on the burning buildings, but, unfortunately, a high wind was blowing, and with the roaring wind, helped by the mass of flames, the conflagration began in hearty earnest. The entire city seemed doomed, and before night an area of buildings a mile and a half long and two-thirds of a mile wide at the greatest breadth had gone under. The writer was present during part of the afternoon and evening, and saw the fire leap along and across streets, without a halt or apparent impediment in its rapid pathway of ruin, so terrific was its start, fanned by the seemingly relentless wind. Everything in the path of that rush of fire was consumed, and no ocular proof determined what business was pursued above this, that, or the other particular ruin. The heat was simply unbearable. None knew it better than the firemen, resident and volunteer, who persistently battled the fiery fiend all day long and until long after Sunday's sun had set. In narrow streets, with flames crackling on both sides and forming an arched furnace overhead, the firemen stood and faced the enemy until it seemed foolhardy to make further resistance. Many faced the flames until their exposed flesh was blistered, and many stood to their task until a falling wall forced them to flee for their lives; but, in spite of their pluck, they were often absolutely powerless, the heat generating and expanding beyond the reach of their streams and driving them back to a safer place. To the writer it seemed remarkable to see the apparent calmness and resignation with which the inhabitants contemplated their great calamity. The entire population was abroad in the streets, and thousands upon thousands of curious visiting spectators thronged every thoroughfare from which a glimpse of the fiery cauldron could be obtained, and still nothing bordering upon a panic was noticeable. Another noticeable feature was the almost entire consumption of buildings and their contents. There was hardly a smoking timber among the mass of stone, brick, iron, and mortar; no scorched merchandise or half-burned household articles found in the thousand and one categories of stock in trade which might be made hereafter available for some form of service. Everything that was combustible was entirely consumed. Before six o'clock nothing remained to tell the sad story but heaps of broken walls, cracked foundations, and smouldering acres of valuable merchandise through the devastated locality where a few hours previous solid structures stood, in their simple grandeur, amidst the silence and splendor of the "breaking Sunday morn." Occupants of tenements throughout the residential sections removed what they could of their household goods; and many, a long distance from the fire zone, prepared to beat a hasty retreat. Sidewalks and squares were covered in a jumbled mass with the worldly goods of the poorer class who saved little of their property. Scores of persons were standing guard over the few things saved, and wondering whether or not they might be obliged to move

them again, so resistlessly did the fire sweep along. Others were rushing about in a vain endeavor to find some means of conveyance to carry their property away. Several large firms had their teams out carting endangered goods to a place of safety. In many cases, hand-carts, wheelbarrows, and baby carriages—in fact, all possible means of conveyance—were brought into requisition, but they were inadequate to meet the ever-increasing demand. Doors and windows of endangered stores were broken open and valuable books and papers hastily gathered by the owners, while employees were running with arms full of merchandise to places of apparent security. Men with ledgers and account books of every description rushed into police stations, hotels, and stores far away from the fire, and asked permission to deposit for safe keeping the only records of their business transactions.

Mayor John E. Beck, and the city officials, Chief Henry A. Spencer, of the Fire Department, and Chief Caspar G. Shannon, of the Police Department, Postmaster Horace B. Lambert, the out-of-town firemen, marines from Charlestown Navy Yard, the several companies of militia, and authorized bodies of special police and citizens, all were busy in their especially assigned duties, and performed their arduous tasks in a highly commendable and praiseworthy manner in the midst of the terrible holocaust and chaos which had seized upon the distracted community. From the outset all that men could do, and all that wisdom, long experience, determined good will, and skilful judgment,—in those truly trying hours,—was performed, gallantly, persistently, devotedly, and bravely. No unnecessary delay was occasioned in the first response to the alarm, no delay was occasioned in giving successive alarms and the calling for outside aid, but from the very beginning the fire seemed favored and guided by an obscure demon agent, whose hidden hand spread the havoc which the ruins mutely attested. Very little criticism has appeared; and how could there? It is easy to find fault when we desire to do so, but the carpers who croak against firemen, at such a trying time, from a disease of chronic fault-finding or from the promptings of an injured, narrow-minded, selfish desire, are not among the class of liberal-minded men whose opinions are of great value ordinarily. The superhuman tenacity and labors of the firemen, increased a hundred-fold by the volunteer companies from other cities and towns, gradually mastered the conflagration, but not until it had laid barren 492 acres stretching across the city and into East Boston, at which point a large detail of the Boston Fire Department, under the personal direction of Chief James A. Mullen, succeeded in extinguishing it. The fearfulness of the situation that had seized upon everybody was ever at its height, and excitement reigned supreme until with the aid of police and about two regiments of militia order began once more; and Monday morning brought with it a show of relief, mentally, though not bodily, for all day long the toilers worked incessantly upon the still spouting, raging débris, among the crumbling and tumbling ruins. The smoke, cinders, and flames were still rioting over and among the remains of a once admired beauty,

and the vast area of burned territory was one sheet of seething, blackened embers, soot, smoke, and steam, from the combined results of the fire and the thousands of tons of water poured into the ruined mass. Such a scene of fright and desolation can be but inadequately described. The strange gliding of the flaming devourer as he leaped across and along street after street, which had been held in pride and borne an accumulated prosperity to the city; the sly, serpentine dancing of these leaping flames, hissing, coiling, burning, in snake-like treachery; the mountains of heavy smoke which overhung the city with the threatening attitude of a number of black, immovable clouds,—presented a weird picture, which words seem inadequate to intelligently and fittingly describe. Exaggerate your imagination to the utmost, and even then you will fail to fully comprehend the enormous destructive scene. The piles of brick, mortar, iron, stone, and wood upon which the fire in its mad fury feeds; as night falls, the lurid glare, paling the moon, lighting up a vast ruined space; the remaining church spires, seemingly holding aloft a finger of fate like a signal of danger and distress; the frenzied, upturned faces, among which were hundreds who had lost everything and saw the accumulation of years of toil and prudence vanish in flames and smoke, which curled about in fantastic shapes to aggravate their misery; the laboring man who struggles for a subsistence, while he lays a foundation to a possible fortune, and the poor working-girl who views the opportunity for the fight with poverty melt away in the pathway of fire; the hoarse shrieks of the fire-engines; the rush of horsemen and the perilous work of the firemen on dangerous walls; the groans of injured, finding of dead bodies, and the hurrying of men, women, and children through the streets; the crash of walls, and the rushing of scores of ambulances, conveying patients from an endangered hospital to a hoped-for place of security,—of the whole these are only a few of the prominent, heart-rending features which go to make up the sights and sounds when the heart of a city is being plucked out by fire.

There is always a bountiful supply of theories and reports upon the origin and subsequent effects of a serious fire, but, after a careful investigation and conference with officials, the writer found the following to be a liberal and just account.

\*“Not since the big Boston fire in 1872 has any Massachusetts city been in such a condition as is the city of Chelsea to-day. With a large area of the city desolate in the wake of the raging flames, all the facilities which make up the life of a modern city have been destroyed. Great suffering and inconvenience have resulted. The streets last evening were in utter darkness. In the dwelling-houses, candles or oil lamps furnished dim light, as neither gas nor electricity was available. What caused the most suffering and discomfort was the loss of the water supply in many parts of the city. The people were obliged to cross the line into Everett and Revere for water to use in preparing meals and for drinking purposes. All street-car lines were out of commission, as

\* From the *Boston Globe*, Monday, April 13, 1908.

the car-tracks were crossed by the flames and the wires were either cut or burned down. Practically, all means of communication with other places is cut off. No telegraph lines are in operation, and the central telephone exchange is a total loss. The post-office was in a burned block, and to-day the people will be obliged to go without their mails. Hundreds who lost their homes and all that they contained carried bank accounts in the Chelsea banks. These people are to a great extent without money, yet every bank in the city is destroyed, and there is no way of drawing funds on their accounts at present. Such is the condition of Chelsea this morning. Residents of the sections which escaped the ravages of the flames will walk to their work or to the nearest line of cars through a wide area laid waste. In many places nothing but piles of ashes mark where beautiful residences once stood. What remains of the humblest tenement and the most beautiful dwellings that were in the path of the fire look alike. Piles of bricks and chimneys mark where on Saturday busy factories and handsome mercantile blocks stood, but to-day blackened, skeleton walls are all that is left of huge buildings."

With the whirlwind, the fire! After the fire comes the still, small voice. After the storm, the calm. The sober second thought of the people is at work. The sufferers looked the dire adversity straight in the face. The noblest of charitable sentiment for others' woes, but a day after the fierce disaster, was demonstrated in every part of the city, by those who had not suffered, in behalf of the thousands the crisis had rendered homeless and penniless. Many are the works of benefaction that the people of Chelsea have extended beyond her own borders, but never has a more noble, humane, Christian endeavor been shown than that inaugurated and administered by the fortunate survivors of the dread catastrophe to the unfortunate sufferers who lost their all. It can be truthfully said that, while the fire was still at its height, relief committees were being organized by genial, warm-hearted, heroic citizens among its population who were burned out; and, while the flaming glare still illumined the sky, a work of assistance and deliverance was begun beneath its shadow. With no work to do and no employers to lean upon, want and suffering could not be far from the door of many of the young, middle-aged, widowed, and orphan-supporting families. But relief was not far distant. True, the sufferers came for relief, and these philanthropic committees took admirable temporary care of them. That animated yet boastful spirit of the United States again asserted itself, for within twenty-four hours President Theodore Roosevelt and officials of various States telegraphed: "Unfortunate Chelsea, much sympathy, how can we best aid you? Let us know. Subscriptions following." Subscriptions did follow, and under the personal direction of Mayor John E. Beck and the Police Department a multitude of homeless people, including many small children, were cared for in a most praiseworthy manner under such exciting and nerve-destroying conditions. To the officers and enlisted men of the United States Navy and Marine Corps, stationed at the

Charlestown Navy Yard, and to the militia, much credit must be given for their knowledge and systematic issuance of rations and clothing. Chelsea will always give praise to these men who labored so patriotically under her trying ordeal of Sunday, April 12, 1908, almost the tenth anniversary of the stirring message of President McKinley to Congress, recommending armed intervention in Cuba, in which some of these men were gallant participants. It remains to give a few brief, closing statements regarding the conditions and effects of this terrible visitation, which has never had its equal in Chelsea before, and which as a destructive fire can safely be added to history as one of the most appalling and disastrous events that has ever befallen an American city. The lessons of this fire are similar in one respect to other large fires, inasmuch as it was demonstrated that buildings of stone, brick, and iron are scarcely less combustible than those of wood, when a conflagration gets beyond the control of the fire department. Although the flames first broke out among wooden buildings, it seemed to increase its uncontrollable headway even after it reached the most substantially built part of the city, and was fed upon block after block of buildings generally considered to be constructed of materials incombustible under ordinary circumstances. It is true that the fire spread out like a fan, and what prevented it from spreading farther is impossible to tell. The great wonder is that, having gone so far in some directions, it did not extend even farther. The seemingly unnatural progress and deflections of the flames at some points are beyond explanation. They moved in obedience to no common natural law, and the admirable efforts of the firemen were futile in most cases to keep ahead of and cover the many queer actions and travels of the flames, so mysteriously did they jump from place to place, first one side, then the other, always ahead and sometimes back again. The movement of the fire at times against the wind may be explained by the formation of atmospheric eddies, whose under-current (caused by the dull heavy heat above) might drive the flames backward. In the Chicago fire of 1871 and Portland fire of 1866 the main progress of the conflagration was, as in Chelsea, with the wind, and the rapidity of their travel was greatly increased by blazing brands blown far in advance of the main body of fire. In those fires also the flames would leap across streets, and for a time seem to burn directly against the wind, without any apparent impediment of progress. The burnt district of Chelsea shows that the heart of the most substantial part of the city was destroyed. The elegant blocks along Broadway, which was the most uniformly built and handsome business street in the city, presented a complete picture of destruction and desolation. The once solid walls tumbled into shapeless heaps, stone and bricks crumbled to dust, and every particle of wood burned out. Another feature of this fire was the immense throngs of people who poured into the city from every possible thoroughfare, and it is safe to say that no fire, since that of Boston in 1872, ever called out a larger crowd. It could be numbered by tens of thousands, and filled the streets from curb to curb, often impeding the

labors of the firemen. Relief soon came, however, in the form of militia companies who approached the scene on the "double quick" and "readily" made room. The military lines were formed across the streets, and the dense masses of people were reluctantly pushed back. "There was no resisting the bayonets," "nor did any one apparently care to." Another spectacle—an inspiring sight, too, if it may be termed so under such sorrowful circumstances—was to witness the arrival of fire companies from distant cities and towns. As the tired horses, panting and steaming, clattered along the pavement, drawing the heavy apparatus and the firemen clothed in rubber and each wearing a helmet, a shout, which ended in a cheer from thousands of throats, would sound a welcome. Welcome they were, indeed, and true earnestness was in every cheer, yet a feeling of anxiety and doubt was, nevertheless, noticeable even in those welcoming cries, so fearful had the people become of the ultimate results. But unfortunate Chelsea is building again, and from the ashes and ruins will rise more modern buildings of architectural beauty. The natural vim and enterprise of her people, with the substantial aid poured in, will overcome this terrible stroke of misfortune, and they will come out a stronger and more energetic municipality. With descendants in plenty of the stirring days of 1776, and with many living veterans who as Massachusetts volunteers were first to enter the field in 1861 and to promptly shoulder a rifle for the freedom of Cuba in 1898, it may be safely concluded that this patriotic community is not one to be beaten down, not even by a misfortune so frightful as this fiery blow that has fallen upon its cosy city. It is a comfort that the best treasures cannot be destroyed even by fire. Culture, character, science, skill, humanity, and religion are beyond the reach of flame. Lay waste to everything, palatial business blocks, costly mansions, grand municipal edifices, churches and schools, and the people with their history and habits remaining will then be a rich and strong people. The sun rose on a growing and prosperous city, from its noon-day height it glared on a lake of fire, and at night it set upon a broad expanse of fire, ashes, and ruin. The loss was so wide, sudden, and entire, and so contrary to all human chances, that it is well-nigh impossible for imagination to compass the ruinous and desolate scene. The financial loss was immense, and brought business distress to many, if not actual bankruptcy. But even a greater and keener loss was the sudden calamity thrown upon the poor, driven from home and from street to street, unable to help themselves, in a distracted crowd, who had but little and had lost that little. In our imagination we cannot comprehend such conditions, for no mind can take in the conception of a loss so magnified and aggravated. Such sad calamities all have their teachings. Let us hope that in a few years the stricken city, now mourning a calamity, will give thanks to the Almighty for the benefaction. When a blight desolates a man's field and distresses his mind, either from natural or malicious promptings, it is well to consider that you likewise may sooner or later be brought face to face with a distress and desolation fully as serious

and painful. "When cities and towns to the right and left are laid barren by fire, we should think what we would do if such a fire should beat us down. Work not less cheerfully for yourself and your own, but not without thought that some of your treasures may be taken away from you at any time."

The affliction to Chelsea was mighty, and, though its results will be long felt by all classes, let us rejoice that from this adversity there is rising a new city, characteristic and monumental of a Christian spirit.

NOTABLE FIRES.

- 44 B.C.—ROME. "Julius Cæsar's Law of Courts Building."
- 64 A.D.—ROME. Almost entire city.
- 1237.—MOSCOW. Almost entire city.
- 1383.—MOSCOW. Almost entire city.
- 1653.—BOSTON. First great fire.
- SEPT. 2, 1666.—LONDON, ENGLAND. 436 acres. \$60,000,000.
- NOV. 27, 1676.—BOSTON. 50 buildings.
- AUG. 7, 1678. BOSTON. 150 buildings.
- MARCH, 1702.—BOSTON. Warehouses.
- OCTOBER, 1711.—BOSTON. Known as Historic "Towne House" fire. 2 lives.
- 1756.—CONSTANTINOPLE. 15,000 buildings. 100 lives.
- MARCH, 1760.—BOSTON. 350 buildings. Over \$1,000,000.
- JANUARY, 1761.—BOSTON. Known as Faneuil Hall fire.
- 1769.—CONSTANTINOPLE.
- 1778.—CONSTANTINOPLE.
- AUG. 12, 1782.—CONSTANTINOPLE. Dwellings. \$15,000,000. 200 lives.
- AUG. 8, 1783.—CONSTANTINOPLE. Dwellings. \$30,000,000. 300 lives.
- JUNE 18, 1784.—ST. JOHN, N.B. Soldiers' dwellings.
- APRIL 20, 1787.—BOSTON. 100 buildings.
- MARCH, 1791.—CONSTANTINOPLE. 30,000 dwellings. \$115,000,000.
- SEPT. 15, 1794.—COPENHAGEN. \$23,000,000. 110 lives.
- AUG. 19, 1796.—SMYRNA, ASIA MINOR. Large part of city. \$50,000,000.
- JUNE 11, 1805.—ST. THOMAS, W.I. Principally dwellings. \$30,000,000.
- SEPT. 16, 1812.—MOSCOW, RUSSIA. Nine-tenths of city. 7,000 buildings.
- JUNE 20, 1818.—CONSTANTINOPLE. Dwellings. \$16,000,000.
- JULY 7, 1824.—BOSTON. Part of finest residential section.
- APRIL 7, 1825.—BOSTON. Part of business section.
- DEC. 16, 1835.—NEW YORK CITY. 600 buildings. \$20,000,000.
- 1835.—BOSTON. Blackstone Street. 50 buildings.
- JAN. 13, 1837.—ST. JOHN, N.B. 115 dwellings and many business blocks.  
\$1,250,000.
- APRIL 27, 1838.—CHARLESTON, S.C. Large part of city. \$4,000,000.
- SEPT. 6, 1839.—NEW YORK CITY. Part of business section. \$10,000,000.

- JULY 24, 1841.—SMYRNA. New section of city. \$20,000,000.  
MAY 4, 1842.—HAMBURG, GERMANY. Stores and dwellings. \$35,000,000.  
APRIL 19, 1845.—PITTSBURG, PA. 56 acres, stores and dwellings. \$5,000,000.  
JULY 19, 1845.—NEW YORK CITY. 450 buildings. \$6,000,000.  
JULY 6, 1848.—CONSTANTINOPLE. Principally dwellings. \$15,000,000.  
AUGUST, 1848.—ALBANY, N.Y. 600 stores and dwellings. \$3,800,000.  
MAY, 1851.—SAN FRANCISCO. Stores and dwellings. \$15,000,000.  
JUNE, 1851.—SAN FRANCISCO. 475 buildings. \$2,750,000.  
DEC. 24, 1851.—WASHINGTON. Congressional Library. \$1,000,000.  
MAY, 1849.—ST. LOUIS, MO. Large part of city. \$3,500,000.  
NOV. 2, 1852.—SACRAMENTO, CAL. Stores and dwellings. \$10,000,000.  
DEC. 10, 1852.—MONTREAL, CANADA. 1,950 stores and dwellings. \$5,000,000.  
FEB. 16, 1856.—CHARLESTON, S.C. Large part of city. \$7,500,000.  
MARCH 6, 1861.—LONDON, ENGLAND. Stores and dwellings. \$12,000,000.  
MAY 2, 1861.—GLARUS, SWITZERLAND. Nearly entire city. \$12,000,000.  
JUNE 22, 1861.—LONDON, ENGLAND. Business blocks. \$10,000,000.  
JULY 4, 1861.—EAST BOSTON. Stores and dwellings.  
DEC. 18, 1861.—CHARLESTON, S.C. About 600 buildings. \$7,500,000.  
MARCH 31, 1866.—VALPARAISO, CHILI. Business section. \$13,500,000.  
JULY 4, 1866.—PORTLAND, ME. 1,800 stores and dwellings. \$15,000,000.  
DECEMBER, 1867.—CONSTANTINOPLE. Stores and dwellings. \$17,500,000.  
1870.—CONSTANTINOPLE. Stores and dwellings. \$8,000,000.  
OCT. 8, 1871.—CHICAGO. 17,500 buildings. \$200,000,000.  
APRIL, 1872.—YEDDO, JAPAN. Stores and dwellings. \$11,000,000.  
AUG. 7, 1872.—NIJNI-NOVGOROD, RUSSIA. Most of city. \$40,000,000.  
NOV. 9, 1872.—BOSTON. 800 buildings, business section. \$100,000,000.  
SEPT. 7, 1873.—HAVANA, CUBA. Principally dwellings. \$8,000,000.  
FEBRUARY, 1874.—LONDON. Stores and dwellings. \$15,000,000.  
JULY, 1874.—CHICAGO, ILL. 360 buildings. \$5,000,000.  
NOV. 28, 1876.—YEDDO, JAPAN. Stores and dwellings. \$11,000,000.  
APRIL 27, 1875.—OSHKOSH, WIS. Three-quarters square mile. \$3,500,000.  
SEPTEMBER, 1876.—ST. HYACINTHE, CANADA. Dwellings. \$15,000,000.  
OCTOBER, 1875.—VIRGINIA CITY, NEV. Stores, dwellings. \$3,750,000.  
JUNE 20, 1877.—ST. JOHN, N.B. 290 acres, stores. \$15,000,000. 8 lives.  
1882.—KINGSTON, JAMAICA. Business section. \$12,000,000.  
JULY 8, 1892.—ST. JOHN, NEWFOUNDLAND. Dwellings, stores. \$26,000,000.  
OCT. 5, 1896.—GUAYAQUIL, ECUADOR. Stores and dwellings. \$20,000,000.  
APRIL 14, 1900.—OTTAWA, HULL, CANADA. Business section. \$10,000,000.  
MAY 2, 1901.—JACKSONVILLE, FLA. Business section. \$12,500,000.  
DEC. 30, 1903.—CHICAGO, ILL. Iroquois Theatre. 590 lives.  
1902.—PATERSON, N.J. 525 stores and dwellings. \$9,000,000.  
FEB. 7, 1904.—BALTIMORE, MD. 140 acres business blocks. \$60,000,000.  
APRIL 19, 1904.—TORONTO, CANADA. Business section. \$12,500,000.

APRIL 18, 1906.—SAN FRANCISCO, CAL. 28,000 buildings, stores, and dwellings.  
260,000 homeless. \$400,000,000.

FEB. 26, 1907.—MONTREAL, CANADA. Hochelaga School. 16 lives.

NOV. 9, 1907.—SUPERIOR, WIS. Part of warehouse district. \$3,000,000.

JAN. 11, 1908.—NEW YORK CITY. Parker Building. \$3,000,000. 2 lives.

JAN. 27, 1908.—PORTLAND, ME. City Hall. Over \$1,000,000.

MARCH 4, 1908.—COLLINWOOD, OHIO. Lakeview Public School. \$35,000.  
175 children.

APRIL 12, 1908.—CHELSEA, MASS.

## FIREMEN'S CHAPTER

### CHAPTER VI.

In considering their duty, have you ever given thought to the exposure that firemen have to endure? If so, the infrequency of death and accident to this class of men has probably caused you to wonder. Have you ever thought how much of the security and protection of the public depends upon them? To spring out of a warm bed at the first stroke of the alarm, quickly get the apparatus started, and then go dashing along, possibly in a wintry wind or a biting cold storm, hatless, coatless, finishing dressing as they speed along, is but the beginning of their chosen labor. Then labor for hours at an exhausting and perilous work with water-soaked clothing, in a freezing temperature, face to face all of this time with grave danger from many sources. The fire out, hundreds of feet of frozen hose must be taken up, a score of ice-coated ladders cared for, chemical engines recharged, all returned to their stations, and the apparatus and equipment at once put in condition to answer the next call.

The dangers and uncertainties of which a fireman's life is so full adds a fascinating interest to it. Generally, he is fond of his calling, and is as enthusiastic to conquer his adversary as is the soldier or sailor. A fire is his battlefield, his comrades are the bullets, and the hose is his field-glass to show him how the attack is being met. With the soldier, however, at the end of enlistment or the termination of war his work is done. The fireman is ever in combat and his battle never done. He is irresistible and supreme, not only from his skill and daring, but because he is allied to natural conditions only. No financial conflicts or corporate schemes should enter his many tasks. He never speculates, but hopes to be ready for the unexpected, which frequently happens. In firemen an infinite kindness and humanity will be noticed, and among them a singular affection rarely found in men in other walks of life. They admire qualities in others which they themselves lack, and seldom allow an underestimation of the superior ability of a comrade. Their work is done with a free good meaning, good sense, and good action, combined with quiet behavior, modesty, and a persistent preference for public welfare and safety. Day and night they plan and prepare the best apparent means to attack a fire breaking out in some narrow alley or congested district. Yes, even your own store and residence has had its share of their thought and surveillance. Wooden blocks in the centre or close to a row of handsome modern structures and the state of repair of all inhabited buildings are always under their watchful eye. Schools, churches, public buildings, theatres, and crowded factories are objects

of their tender care. They are generally free from the practices of sentimental politicians, and, when great issues of currency or industry invade the ranks of the people and key them to a pitch of frenzy, this army of public servants, cognizant of their momentary importance, are found cool, alert, and quietly performing their duty. They labor without a show of pomp or power, are capable, conscientious captains of their industry, and awake to every improvement along progressive lines. They are by nature quiet and unassuming, though they take nothing for granted, investigating before believing. But,



CHARACTERISTIC WINTER SCENE

when assured they are attacking the very vitals of a serious fire, they stand deterred by nothing and overawed by none, unless a better plan of attack presents itself, when they will change their positions with a daring bordering on recklessness. For centuries their field has been one of anxiety and continued activity, mingled with occasional great tasks that have a marked page in history, and of almost unparalleled sacrifices, which have found a place on the roll of honor.

When we are disturbed at midnight by the dreaded alarm of fire, what follows our sudden awakening from sleep? We hear the apparatus coming, get up, watch them as they rush along, and then return to bed with a sense of

satisfaction that the fire is not around us. In a few minutes we are again disturbed by struggling sounds and discordant voices, a terrifying illumination reflects into our room, we hurriedly dress, rush out, and find that a fire, encouraged by a high wind, has made lightning-like headway, and is reaping destruction as it blows along with a furious roar. Half-dressed people are hurrying along the streets, mothers, whose homes have taken fire, are clasping to their bosoms helpless infants, and other children trot along by their side, probably lost them-



AFTER A NIGHT OF COLD WORK

selves. Walls fall with a cracking and crashing like thunder, and the shrieks of entrapped people grasp our thoughts. A stout-hearted man, with a little bundle and a framed portrait of some loved one, looks back to where his loved (and now flaming) home stands, and tears roll down his cheek. Ambulances bearing injured go speeding to the hospital. The glaring light shines on the faces of the assembled crowd, giving them a sickly look. Horror-stricken people stand around in little groups. Strangers slap each other on the back, shouting suggestions, and act as if they had lost their reason. The flames sweep up in a seemingly revengeful fury. Churches, beautiful blocks, handsome mansions of the wealthy, and the cosy homes of the laboring class lie in ruins, the prey of the gluttonous fire. Lives have been lost, many have been injured, and to some have come misery and

ruin,—vividly presenting a living picture, not prompted by an overdrawn or excited imagination, but of a solemn melancholy truth, to which many of us have been a witness.

The press in their account of the horrible event explain its origin, extent of loss, and how the fire was subdued. Pictured groups of firemen are shown, and the list of killed and injured graphically given. It is then we realize that, from outside the ropes where the public watch a fire, things are considered quite uneventful. To only the men within (firemen) are known the tears, groans, deaths, and destruction, with the narrow escapes and noble rescues.

To give the impression that recklessness is a quality in the many risks taken by firemen would not be true, for their life is too full of real peril for them to

needlessly expose it. In going to or working at a fire, they take a risk that might at any moment place them face to face with a cruel death. It is generally the spectacular act which the public applauds, but conspicuous and hazardous deeds, done before the public eye, even though they be the saving of life, are not always the most dangerous conditions into which firemen are called. When caught inside a building, in a smothering smoke with fire all around, and while holding to their fight, to have a hot-air or other explosion occur forces to action a daring nerve and skill which the public seldom see, and causes a peril the firemen know too well.

A hot-air explosion, or "back draft," is caused by the heated condition of the air, which generates a gas where the heat has no chance of escape. Thus it will be seen why firemen, arriving at an apparent serious fire, open doors and windows, to allow the smoke to clear and give vent to the heat, thereby diminishing the possibility of such an explosion. Of these explosions there is seldom any warning. They are the fireman's most dreaded foe, and have claimed the life of many a brave "laddie." Suffocation from smoke, while not uncommon, is seldom fatal.

It is nothing short of wonderful, the length of time that firemen can endure smoke so dense that but a few feet away they are obscure. In particularly smoky places, firemen may relieve one another by lying on the floor, where there is generally a light current of air, or, by pressing their faces close to the stream forcing through the hose, get what little air comes with the water. However, when men will remain in a smoke so thick and heavy that a lantern light will not burn for want of air (and that often occurs), the name of "smoke-eaters," by which these men are called, is a title well earned and ably defended every day. Firemen will take many great risks, their work at all times requiring nerve, coolness, deep study, and rapid calculation, and in an emergency involving a greater peril, from which an ordinary man would shrink, they appear the more determined to accomplish the task, plainly indicating that fear is either a forgotten or unknown quality to them, while in the performance of duty. The fireman's field is not like that of the soldier who has the eye of the nation upon him.

There is no band to give cadence to his step, no bugle to sound a thrilling order, no array of splendor or cheering of comrades as the troops swing along to action, no "stars and stripes" or state banners waving in the air to inspire and excite an enthusiastic ambition when called upon to perform the "charge." On the contrary, firemen in groups of four or five drag squirming hose over the edge of lofty roofs or through windows, up high ladders and on dangerous cornices, into cellars and sub-cellars filled with smothering smoke, poisonous gases and acids, and in water knee-deep, until they have extinguished the object of their call. During all such perilous work they are generally unseen. The climbing to dizzy heights, the handling of scaling ladders, and the jumping from buildings into the life-net are a part of the training they receive while "proba-

tioners" in the drill school. Such a routine generally brings out the quality of what they will be "under fire," and from here many men are declared unfit for further service, and are dismissed before they have entered the regular ranks. Clinging to a ladder possibly seventy or eighty feet above *terra firma* is generally a sufficient test to convince those of a timid nature (especially if under a similar condition they might be surrounded by flame and smoke) that such an experience is the product of a business that was not intended for them.

It is, therefore, a rare occurrence when a coward is dismissed from the fire service, for their quality is generally noted, and they seldom get beyond the drill school. In the fire-house their life is one of impatience and anxiety, relieved only by the stroke of the gong which starts them away on their mission of indispensable daring adventure. Not that firemen enjoy fires (they fully enjoy putting them out) and the necessary dangerous risks arising therefrom, but in the large cities, where the average number of yearly alarms are counted by the hundreds, these men seem to know by instinct when they are to be called upon, and are therefore constantly expecting, prepared, and waiting for the first tap of the gong. That the firemen of a modern department must pass through a technical course of training is ably explained in the following address, given at the Twenty-eighth Convention of the Massachusetts State Firemen's Association at Fall River on September 11, 1907, by Lieutenant Daniel O'Brien, former drill-master of the Boston Fire Department, who was an exceptionally proficient and successful instructor:—

#### ADDRESS.

##### ADVANTAGES OF DRILL TOWER AND WORKINGS OF SAME.

*Mr. Chairman, Gentlemen and Guests of the Convention,*—I am somewhat unaccustomed to appear before such a large assembly in the rôle of an orator. Proud of the humble title of fireman, I have known only one spectator,—my chief. His directions I have tried to follow with religious exactness, even though the way was dark and the circumstances uninviting. But you have asked me to write an essay on the drill school of which I am instructor, and I can assure you that I accept such invitation with pleasure, knowing that it would be cowardly and unbecoming a fireman for me to refuse.

What I am about to say is from the information culled from my experience with Boston's greatest fire-fighters. I am fully cognizant of the body I am addressing, and yet I hope my feeble words will be of interest to you.

As a young man I look forward to the dawning twentieth century. I revere the veteran fireman. I have nothing but reverence and esteem for the brave men who in years past fought with boldness and almost reckless daring with the apparatus at their command, who met conditions as they found them, and whose heroic work, unselfish devotion, and magnificent courage threw a lustre on American manhood,—the veteran fireman, who a half-century ago with

his hand-tub and rope pursued the fiend in all quarters of the town by day and night and grappled with it with buckets, axes, hooks, ladders, and ropes, can have nothing but reverence from me. They laid the foundation for the fire departments of later days.

But, gentlemen, loving as I do all veteran firemen, as a comparatively young fireman and occupying the position of drill-master in the Boston Fire Department, I cannot but look and study the present conditions which confront firemen and which are sure to confront the departments in years to come.

These days of the horseless engine, the automobile, the trolley car, the thermostat, the elevated railroad, and the sixteen-storied building, are something that our forefathers never dreamed of: these are the things, however, that the incoming firemen must study. The drill school of Boston teaches that the water-tower supplants the bucket brigade, and that the horseless engine takes the place of the historic rope and tub.

The Roman soldier was required to breast streams with his armor on, and to run with his sword, shield, and helmet, while his drill-master carefully viewed his efforts. As hard and exacting as that ancient drill is the manual of the firemen of Boston. There is no straining after the spectacular in the school of instruction. You know that beneath the billows of smoke and the rolling flames, undisturbed by noise and excitement, keeping their equanimity under the most trying circumstances, the firemen are battling with the fiend in no haphazard way. They work against the fire and for saving of property on well-defined plans laid down by a competent officer, who is on hand, personally superintending the operations. Experience has taught the men how to work, yet they owe a great deal to the drill school, many firemen of the present day having been taught in this department school of instruction. The drill school, while not a new institution, is doubtless all the while taking on additional value and breadth, like all progressive, well-conducted schools.

It is the final test for the fire department. The mental, medical, and gymnastic tests, which enter the civil service examination, precede. All these are the academic branches of his training. The drill school is the professional part, and, unless he can satisfy its many exactions, involving intelligence, quickness, strength, discipline, and courage, all that he previously accomplished counts for nothing.

The evolution of the fire department of large cities has not been among the least conspicuous instances of the gradual transformation of haphazard methods into systems of discipline and efficiency of a very high order. The improvement in this respect has been more marked, perhaps, than the advance in the appliances for the extinguishing of fires. Of course, the permanent department is the only reliable study, where under present conditions in Boston it is a splendid body of men. Still, the drill school is a quickening and assimilating force. Until this was established, the new recruit would be assigned to either the ladder or engine company, and acquired his training by slow degrees. If from that par-

ticular branch of service it became desirable to transfer him to another branch, he had to start in on many new things from the beginning.

In the drill school he is trained for any and all kinds of service in the department. He must know the names and uses of all apparatus, implements, and combinations, not only theoretically, but practically. He must have his coolness, strength, and steadiness tested by the Pompier ladder, life rope, and jumping net drill; he must be taught how to raise and set to work the water-towers.

The school of instruction opens on the 1st of May each year. The embryo fireman comes to the school from all walks of life. In the course of thirty days' tuition he finds that there is a great deal to learn. Deportment, discipline, and courage are the lessons. Obedience to his chief at all times and under the most trying circumstances, ay, even though death faces him, is inculcated into his mind. The nobler qualities of man are brought out in him. It perhaps seems a startling statement to say that courage can be taught to a man, but yet, as a mother-bird teaches her young to fly, so does the drill school teach a man, who trembles on reaching twenty-five feet in the air, to mount to the fifteenth story of a modern building without fear or anxiety. Presence of mind at a fire is a very essential thing. When a life is in danger, the men are taught how to save it. They are taught to imitate the bravery and courage of their chiefs. Where a Boston chief does not dare to go, he never asks his subordinate, yet a chief has never failed to go when duty called.

The men are taught to become acquainted with every piece of apparatus and to bring from that apparatus all its value.

The criticism made by some is that fires in towns and cities outside of Boston cause considerable damage on account of the unskilfulness of the firemen. The courage is there, but the science is lacking. Boston might be able to teach them a lesson. Have you seen a serious conflagration in Boston for the last few years? No, you say. You see the effect. What is the cause? Scientific fire-fighting, promptness, intelligence, and intrepidity,—that is what shines in the Boston Fire Department; and these virtues are held up to the young firemen for emulation. Carping critics may say it is luck, but, gentlemen, the truth is truth: the phenomenal record of the Boston fire chiefs appalls the chiefs of other great cities.

The incoming firemen are thoroughly trained in the saving of property, too. There is no reckless waste of water, no dramatic axe-work, but good, quiet, hard work. Other towns and cities in this Commonwealth could perhaps learn a lesson from the rules laid down by Boston's fire chiefs which are carried out in the drill school. Look at the Pompier ladder, for instance, the only instrument by which men can reach a fire in the fourteen or fifteen storied buildings. I quote as instances the Windsor Hotel and the Postal Telegraph Building fires in New York. Here are circumstances which the modern fireman must meet in the future. Look at the wonderful work done at the Windsor Hotel fire by the Pompier ladder, see how many lives were saved by it. Consider the bravery of the New York firemen in reaching the top of the Postal Telegraph Building

and fighting the fire over a hundred feet from the ground. Were these things ever thought of by your father or my father?

Let us look forward, not backward. Let us welcome with open arms the twentieth century with its horseless engines, its mile-a-minute trains, and its automobiles. Let us incorporate electricity into our departments. We are not afraid of science, and we welcome the inventor, and our courage and ability will persevere, and make the American fireman in the years to come what he has been in the past,—the admiration of the world.

Yours respectfully,

LIEUT. DANIEL J. O'BRIEN,  
*Drill-master.*

What the firemen expect and what is expected of them was plainly, intelligently, and solidly given by Chief Edward F. Croker, of New York City, shortly after the tragic death of Assistant Chief Kruger, of that city. The *Boston Post* of February 19, 1908, reads as follows:—

**BRAVERY INHERENT IN ALL FIRE-FIGHTERS.**

NEW YORK'S CHIEF SAYS WHEN MEN MEET DEATH IT IS ALL IN THE LINE OF DUTY.

NEW YORK, February 18.

Chief Croker at his desk in fire headquarters discussed from the standpoint of a fireman the chain of adverse circumstances which in the past few weeks has cost the department the lives of deputy chief and four subordinates. He bluntly declined to ascribe extraordinary bravery as cause of the death of any one of these men, neither did he impute recklessness.

Assuming bravery to be merely a part of the physical and mental make-up of every fireman, the chief, in searching his memory for instances of deaths occurring in such manner as to warrant the terms heroic or foolhardy, was unable to recall more than three or four which had come under his observation or knowledge as an officer of the department.

"Firemen," he said, "have been killed in this city before poor Charley Kruger and the other chaps gave up their lives. And," he added, with that characteristic bull-dog shake of the jaw, "firemen are going to be killed right along. They know it, every man of them. When they join the department, they face that fact. They know that fire-fighting is a hazardous occupation: it is dangerous on the face of it, tackling a burning building. The risks are plain."

*Firemen know the Risk.*

"There is not a man in a fire company in this city that does not know this as well as you or I do. Consequently, when a man becomes a fireman, his act of bravery has already been accomplished. What he does after that in the way of routine, even if he meets death, is all in the line of his work. He was not

thinking of getting killed when he went where death lurked. He went there to put it out—and he got killed. So you see that's about all there is to it.

"Don't think I am trying to belittle any of these men. If I tried to do that, I'd only succeed in belittling myself. I am only making these points to show

that fire-fighting is regarded by the men engaged in it as a business, and that they do not regard themselves as heroes because they do what the business requires.

"There was, for instance, no better or braver man in the department than Chief Kruger, nor a man whose loss would mean more from the standpoint of efficiency. But, at the same time, he did nothing unusual in going into the cellar where he lost his life. It was not the cellar of the building which was burning. It was the one adjoining.

"He went in to gain a strategic point from which to fight the fire next door, and fell through the trap-door. He had no more idea that he was so near to danger than the citizen walking along the

street who suddenly falls to his death by reason of a cave-in or some hole left unguarded by workmen."



RUINS OF FIRE THAT COST LIFE OF DEPUTY CHIEF  
CHARLES KRUGER

#### *A Chief's Duty.*

Chief Croker said that it was the duty of a chief in charge of a fire to avoid sending his men into places where the chances of not coming out alive largely outweighed the favorable possibilities. A competent fireman, he remarked, was usually able to estimate quite accurately the condition of a wall of a burning building. The firemen understand that they are acting upon the best judgment of their commander, and go where they are told.

Chief Croker scouted a statement made after the Canal Street fire, that firemen were sent as soldiers into a forlorn hope, with the understanding that, while they might obtain a desired result, they would give up their lives in the task.

"Of course," said the chief, "the object of fire-fighting is to put the fire out. In order to whip a fire, you have to get to it and pretty close to it, at that. When you get close to a fire, risks begin to multiply. You have to take them for granted. But, when the problem of letting a building go or losing several men comes up, a chief will let the wall go to hades."

*Must check Fire at Any Cost.*

"At the same time no chief has a right to let a fire get away from him. If a man is too apprehensive as to what may happen, the flames may communicate to another building, and then to another, until, before you know it, you have a Baltimore or Chicago fire on your hands. Such disaster can be prevented by getting after a blaze hot from the start and killing it good, and that's more dangerous work than the other way."

During the past half-century the improvement and subsequent progress of firemen and fire departments have been accomplished through a series of scares, involving many millions of dollars and thousands of lives. A recent illustration of these scares was the terrible fire in the Lake View Public School in Collinwood, a suburb of Cleveland, Ohio, in which 175 children perished. No definite cause of this fire has ever been ascertained, yet it was known that the school was without fire-escapes, and had only two entrances, one of which was locked and the other one opened inward. Of the construction of this building we are not familiar, but we do know that, ere a week had passed after that overwhelming disaster, there was not a city or town in the United States (it is safe to say) that did not start at once investigating the conditions of exits from their schools. The money loss was \$35,000, but the example the Lake View School set before the country to determine the value of those 175 pure, innocent school children is beyond the reckoning of man. From January 1 to April 1, 1908, there were fifty-eight instances where the pupils of schools were imperilled (in the United States and Canada). In one of these the property loss was \$100,000 (Betts Academy, Stamford, Conn.), in many of which the loss of life might have been far more appalling than the Collinwood School but for more fortunate conditions.

Following the Chelsea (Mass.) conflagration, many cities and towns have passed ordinances requiring more apparatus, equipment, and permanent men, notwithstanding that the extent of danger is no greater to-day than previous to the Chelsea fire, but the warning aroused them from a dormant, indifferent, unintelligent condition, and brought them face to face with the problem, "What should we do if a like calamity threatened us?"

We have known of a "chief" of a large city requesting in his annual report year after year additional apparatus for some growing district, for needed alterations in some unsuitable quarters, and for extra permanent men as an as-

insurance to better protection, and we have seen his recommendations disregarded until a scare forced upon the city government the absolute necessity of appropriating the very requirements which the chief so persistently sought. The burden on a chief of a fire department is great. He should be provided with every reasonable improvement which to his trained mind is needed and beneficial to the working of his department. He, and he alone, realizes and comprehends the detailed responsibilities intrusted to his care and incumbent upon his judgment. The most effective apparatus and the most rigid vigilance are by no means absolute assurance that a fire will not start. However, early notification, quick response, and proper appliances for attacking a fire are requisites every chief should have at his immediate command, thereby furnishing him with a support in keeping with his endeavor.

There is perhaps no department of a municipality (except the fire department) but that could suspend operations for a day, or even a week, without serious increased liabilities, that could be replaced or overtaken in a comparatively short time; but allow the fire department to be suspended for one hour, and a disaster might occur the magnitude of which the world has never known. Yet we hear of men of property and of general worldly prudence (I wish I could say wise men) who publicly oppose progressive measures and economical appropriations necessary for maintaining an efficient fire service. A fire department improperly equipped for action is as useless as an army in battle without ammunition.\* Therefore, any one who opposes the financial appropriation actually necessary to conduct and maintain such departments is guilty of increasing the very liabilities that firemen endeavor and are expected to overcome. We cannot think, however, that the opponents to fire department appropriations are prompted by selfish or penurious ideas, but, rather, lack the proper knowledge of the many indispensable details imperative to the inner working of a modern service. Could all property-owners even partially comprehend the thousand and one things which crowd a fireman's mind in the performance of his duty, we doubt if any honest, conscientious chief would be disregarded when he said, "I need another engine, more hose, or more men." His requisitions would be happily approved, and he would get them. Those unacquainted with the duties of firemen, particularly when in active service, cannot appreciate the gratification that dominates and imbues them when they are cognizant that the American firemen have established a standard of bravery and intrepidity which would be hard to equal and impossible to excel. With such a record the firemen should be granted every reasonable request that would enable them to meet with more confidence the numerous perplexing tasks which challenge their efficiency. The development of industrial fire departments is well recommended by the following figures. The number of alarms in the city of Philadelphia during the year 1908 was 3,759, the value of property endangered was \$62,082,375, the actual loss thereto, as paid by insurance, was \$2,440,338,—a trifle less than 4 per cent. The total valuation of the city of

Philadelphia is approximately \$1,316,426,878, which figures further elaborate the highly commendable and efficient service of the fire department of that city.

Such an excellent comparison of figures explains for themselves and unquestionably displays that an able fire department, to a great extent, is self-supporting. Hence a fire insurance company taking a risk in a city or town having improper fire protection determines the ratio of liability commensurate with the protection provided. People residing in a section with a poor fire service pay larger premiums than those in a community maintaining a reasonably equipped service. This fact is easily summarized.

Fire departments consistently organized, equipped, and trained, release the populace from a certain amount of worry and anxiety, and are, therefore, a valuable asset, far more so than the monetary value of the small fractional part of a city or town's revenue required to maintain them. The work of firemen is exceedingly hard, but such is the readiness and pluck of these men that their duties and experiences read like a thrilling chapter in a startling story of fiction. Wild rides, winter storms, and flaming buildings are a part of the life they have chosen to lessen the "scares" that have too often visited our domain. Fire departments must be regarded, and any reasonable expense necessary to maintain them (all things considered) is comparatively a small expenditure. Every citizen should co-operate with the firemen in securing modern practical appliances for operating against fire. "A strong attack weakens resistance."

The public are the supporters of the fire department, and should enter without hesitation into all projects intended to increase its general efficiency. They should make and enforce strict laws against the use and storage of dangerous merchandise, and provide against improper obstruction in public thoroughfares. Considering that the best is the most serviceable and durable, the public should demand that all apparatus and equipment be of that class. They should at all times have a careful, watchful eye upon the fire department, otherwise, though composed of brave, conscientious men, they may become formed into a political system which would render them inefficient and unreliable by reason of the possibility of changes characteristic to political events. The fire department in politics, while by no means unprecedented, is nevertheless damaging to public welfare and safety. Years ago fire companies were often strong public bodies, and their influence was much sought by political aspirants. Happily, laws have been enacted in most cities and towns making secure from outside influences the position of firemen under ordinary circumstances, and rightly so, too, for the efficiency of firemen is seldom decreased by experience. A fire department, well organized and accustomed to its duties, should remain unmolested in its calling, free from the dictates of petty office-holders whose first desire, generally, is the gratification of a political ambition, and whose earnest and wholesome regard for the welfare of any department is small compared with their regard to gain an anticipated position. No one can realize this so

well as the chief, who (although his knowledge and experience should at all times place him in a supreme position) must often stand aside and abide by detrimental acts and dictates of an untrained, unintelligent, or uninformed power.

In the performance of active duty the chief alone is supreme, and at such a time need not even listen to suggestions unless he chooses. It should be enough that his ability (recognized and trusted when the entire department is concentrated at a serious fire and every detail at work) is sufficient to arrange and plan changes and improvements, when the department is not "under fire." All soldiers are soldiers, yet all soldiers cannot become generals. So it is among firemen. The chief with his bravery must also possess the combined qualities of quick perception, resourcefulness, fearlessness, and the tact to properly command and control his subordinates.

While engaged on a serious fire, it makes a vast difference to the firemen from which side the chief takes his view. If he measures, arranges, and executes undertakings with a confident, encouraging exterior, it puts fresh life into the men and holds them with a feeling that the "chief" is the right man in the right place, and they will work with renewed vigor to assist him with his burden. Able chiefs have a rare tact and gift of disguising uncertainties. No matter what their feelings, they neither express nor show them. During a struggle with a threatening fire, should a chief become excitably disgruntled, bite his lip, chew his mustache, wring his hands, and exclaim with a whine, "We shall lose this building," he would in all probability disable and upset the entire work, disheartening the willing firemen by such unfit language and incompetent demeanor. Fortunately, it is exceptional, when such a man is "chief," yet it better presents the characteristic ability, firmness, and confidence of most chiefs, who, although meeting with a slight reverse, never display or acknowledge it, but instead re-enter the contest with stronger, persistent determination. Firemen who see their chief bearing a bright, hopeful countenance catch the spirit themselves, and, should the task assume a darker outlook, they will tax their exertion until every opportunity is exhausted or the fight won. Every man, whether at the head or rear of a procession, has felt the power of a strong leader. "A strong leader is the winner of success."

A characteristic part of a chief is leading a group of men to an advantageous position, and impressing upon them the importance of the part they are expected to perform. He must be everywhere in his course of rapid scrutiny, pausing only long enough to order a ladder here or a line of hose there. His heart beats with the throbbing and puffing engines, his cool, unmoved, vigilant demeanor fills the men with confident anticipation, while he, watchful of the contest, achieves his effects by the intuition of genius and the wisdom of experience. The longer a chief is in service, the more anxious the people should be to retain him. He and his immediate assistants know the growing requirements of their community. They have studied the conditions of old buildings and watched the construction of new ones. They know the congested districts

with their narrow alleys, and the dire possibilities that surround the danger zones. They plan ahead, so far as it is possible, and hope to be prepared for an emergency. The continued victories of long-service fire chiefs plainly indicate their value,—a value that should be weighed and respected accordingly.

While it is true that firemen are paid, it should not detract from the many brave and heroic risks they take, for it is not all in the line of fire duty that they perform their noble deeds. Stopping runaway horses, making rescues from drowning, and many other commendable feats are constantly accredited to this class of servants, many of whom have received deserved public recognition. Property-owners and tax-payers in general should feel proud of the grand work these men do, and become more familiar with the grandeur of their undertakings, which mean so much to the public as a whole. No one can appreciate the extent and character of their sacrifices unless they visit their quarters and see the innumerable details requiring attention and the wonderful resources they display. At every alarm, every time a piece of apparatus goes dashing along, we look for something of a thrilling interest, and follow their reverses and successes with a mindful satisfaction that it all means a more abiding assurance of their future ability and worth. With every large fire their alert, ready minds and indomitable courage are the qualities which endear them to us. But know them in their quarters! Practical, unassuming, magnetized to their work, and then they become more strongly endeared to us as they sit and lounge about in a restless expectancy, realizing that the hour just gone has left them all together, while the next may claim some of their number in the great beyond. When in action, their life is a sort of a playing-with-death game; when on watch, like the soldiers on a firing-line, anxiously waiting the command to charge.

In brief, such is the life of firemen, and, while to a casual observer no regular system appears, they are nevertheless governed by a rigid discipline, which can instantly show the location or station of every man. When a serious fire occurs, calling out a large part of the men and apparatus, those not responding are changed and moved from one station to another until all the districts are equally protected. The duties of fire departments are of general vital importance, their conditions furnishing abundant material for thought and discussion which should be heeded by all public authorities and private interests. Their work is seldom bungling, yet often criticised. Therefore, they are worthy of investigation that would furnish the public with a better knowledge of their interesting labor. We hear of heroes of the battlefield, of the seas, and various other callings, but we seldom read of the many heroic deeds performed by firemen in their daily routine of preventing conflagrations. Few great fires have occurred that have not been baptized in blood, yet fatalities are wonderfully few compared with the many perilous tasks incident to the life of firemen. They are heroes in more senses than one, and, while they are ever ready to risk their lives in the faithful performance of duty, there are many instances where they have exposed themselves to injury, and even death, in making seemingly

impossible rescues. Fires are whirlpools of risk which claim annually a large number of lives, strikingly illustrating the value of knowledge, coolness, and intrepidity in danger. In conclusion, let us not slightly appreciate the importance of their enterprise nor their individual endeavor. Instead, let us



SOLDIER-FIREMAN STATUE AT GETTYSBURG  
BATTLEFIELD

consider, when we see them mounted on rushing apparatus, that some one of the "spirited crew" may be responding to his "last alarm."

There is a particular bond of friendship between soldier, sailor, and fireman, inasmuch as their duty is the safeguarding of life and property,—the fireman to protect and reserve from fire, the soldier and sailor to defend from invasion or rebellion. During all of our largest fires the "military" has been ordered out for guard duty, and performed highly commendable service. For years there has been a strong friendship between the National Guard and the firemen, strengthened no doubt by the admirable work of the Philadelphia Fire Department during the late Civil War in caring for returned sick and wounded soldiers. Another incentive was the mustering of the 69th New York Infantry, United

States Volunteers, who also served during the same war. This regiment, recruited under Colonel Ellsworth, was made up entirely of New York firemen, and bears an enviable record, having participated in many of the memorable engagements, including the battle of Gettysburg. On a visit to this memorable battleground the writer was particularly impressed with the beautiful monument erected to the memory of that regiment, and procured a photograph of it, a reproduction of which will be found on this page. The base of light brown granite, simple and rough, yet handsome in design, with a bronze tablet set in on either side, is surmounted by two magnificent bronze statues, one a soldier with his rifle, the other a fireman holding a trumpet, emblematic and significant, mutely uniting the patriotism, valor, and fidelity characteristic of both.

## CHAPTER VII.

The great task of making effective portable machinery for use against fire has been materially lessened by the application of steam, and to this invention a large proportion of the advancement in fire-fighting is due.

Steam machinery has in the progress of time become as great a factor and since its introduction has worked as marked a revolution in fire-fighting devices as it has for purposes of travel and manufacture. The benefits derived from this means are well-nigh incalculable. Up to the present time the most important though not the most powerful machine used against fire, which is familiar to nearly every one, is the steam fire-engine. Its power is available almost everywhere, yet to a mechanic it is really a simple machine. Set between the rear wheels is an upright boiler with a spacious fire-box at the bottom and a short smoke-stack on top. In one of the best-known makes there are two steam-engine cylinders bolted to the front of the boiler, and two pump-barrels bolted above them, so that the piston-rod of the engine is also the pump-rod of the pump. The steam drives the piston to and fro in the engine, drawing water through the large suction hose on one side, and forcing it out on the other side through a smaller hose. From the pumps the water is forced to an air-chamber, which forms a cushion and serves to equalize the pressure, giving an even distribution to the discharge of water. The principle of these pumps is very much like the pumps of the hand-engine, but with tremendously greater power. The products of combustion pass through tubes that are surrounded by water, as in the ordinary boiler of a locomotive. The water tank for supplying the boiler receives its supply through a small pipe connected to or near the suction chamber and pumps. The steam cylinders in the various sizes of these engines range from 6½ to 10 inches in diameter and have a stroke of 8 inches. To assist the draft and general working of a "steamer," they exhaust into the smoke-stack.

In another popular make of steam fire-engine the pumps are of the rotary type, and are considered by some mechanics superior to the "piston pump." Both makes referred to, however, have been very extensively used, and seem to bear an equal amount of very creditable indorsement. So powerful is the pressure of water from the larger sizes of these engines that manufactured holders are often applied to assist the hosemen in controlling the stream. On a visit to the two largest fire-engine factories in the world the writer gained a slight knowledge of the general detail. A non-mechanic, unaccustomed to the daily routine of such factories, can hardly realize the magnitude and importance of the work. The rigid inspection and careful selection of all material, the intricate exactness and minute fineness with which every part and detail must

be tested, prior to acceptance as a relation to the steam fire-engine, are the first impressions the stranger receives when visiting such an industry. The necessity for an absolutely reliable power has up to the present time compelled the use of steam, and precluded all other "agents of strength" in the making of a fire-engine. In the United States alone there have been over one hundred attempts to manufacture reliable steam engines for use against fire, and the list that follows presents a long line of financial losses, accompanied by a series of direct and bitter disappointments, inasmuch as the majority of models, when placed under the test necessary to fire service, revealed defects (generally in the boiler or pumps) which at once rendered them unreliable and unfit for use, hence their manufacturers were not warranted in placing a single product of their "coveted construction" upon the market. The building of steam fire-engines covers a period of eighty years, and the active manufacturers of to-day owe a large measure of their success to the downfall of the less fortunate concerns by having reaped a knowledge of the defects and by following the practical and comprehensive necessities of the special requirements conducive and compulsory to the severe duty this type of "mechanical skill" is called upon and expected to instantly perform.

While Braithwaite was constructing his first model in 1829, he had as a business associate Captain John Ericson, and they as "Braithwaite & Ericson" built four engines. In 1833 Braithwaite succeeded the former firm, and built one more engine. Therefore, while the inventor of the original, it can also be stated that Braithwaite was the father of the first five steam fire-engines ever built. The credit for the idea of a self-propelled engine is probably due to William L. Lay, of Philadelphia, who in 1851 attempted the construction of such a model, which, however, was never completed.

During the last ten years great strides have been made in the "gasolene" fire-engine, the first of which were drawn by horses, and a number of these are being effectively used at the present time. A little later practically this same form of engine was constructed along the lines of the automobile, and, considering the great progress made in the construction of auto-trucks during the past ten years, it is reasonable to expect that the auto fire-engine will in the near future become a popular and common fixture in fire-fighting apparatus.

The growing popularity of automobile fire-wagons, and the "high-pressure" or "direct pumping system" which has been installed in many cities with excellent success, predict the ultimate disuse of the steam fire-engine. Like the "hand-engine," which was crowded aside by the "steamer," so also will this time-tried and true, invaluable and venerable machine gradually give place to more modern inventions. It will, however, be many years before this "pride" of all firemen will be noticeably discarded. The never-failing performance of duty, the hour after hour of continuous and tireless service, and the large quantities of water which these engines could always be relied upon to discharge are matters of jealously guarded record that no fireman will

forget or even overlook, when selecting a successor to the steam fire-engine. Regardless of past or future inventions, the steam fire-engine will always be a leading subject, demanding a conspicuous position in the history of fire department enterprise and progress.

It would be almost impossible to furnish a perfect record of the many attempts which have been made in steam fire-engine construction, since of the scores of models which have been experimented with there remain at the present time but a very few concerns who still continue in this line of manufacture, noteworthy among which are the "American LaFrance Fire Engine Company" of Elmira, N.Y., the "International Power Company" of Providence, R.I., the "Nott Fire Engine Company" of Minneapolis, Minn., and the "Ahrens Fire Engine Company" of Cincinnati, Ohio. As the American LaFrance Company and the International Power Company are the largest manufacturers of steam fire-engines in the world, the following will give the reader a knowledge of the many technical and important changes subsequent to their inception. The first



SINGLE PUMP AHRENS ENGINE



BUTTON ENGINE

steam fire-engine built in the United States was used by the city of New York in the year 1840. This machine, designed and built by Paul R. Hodge, was a straight frame model, mounted on four wheels, with the boiler lying horizontally between the frame, with pumps attached to each side of the boiler, and with suction inlet and discharge outlet mounted over the front gear. This was the only machine built of this design. No other engines were built until 1852, when the firm of A. B. & E. Latta of Cincinnati, Ohio, constructed a piston engine with a water tube boiler, using forced circulation by the use of a peculiar pump attached for this purpose. The pump was of the double-acting piston type on the hydro-pneumatic principle. This machine was made entirely of iron, mounted on three wheels, and weighed about 12,000 pounds for a first size model. This company also built a self-propelled engine of this type, which it sold to the city of Cincinnati, and this was the first self-propelled engine to be placed in active service. In 1863 the patents of the "Latta" engines were bought by Lane & Bodley, and were again sold in 1867 to C. Ahrens & Co., who began the early improvement on the piston steam fire-engine. Ahrens

& Co., after building a few engines of the "Latta" type, developed the Ahrens single pump engine, which was a decided improvement over their former production. The boiler was of the coiled tube type, with a circulator to force the water through the boiler. The pump was of the piston type, mounted in front of the boiler in a vertical position. Other piston engines of successful design



SILSBY, 1856

were built by Button & Blake of Waterford, N.Y., Clapp & Jones Manufacturing Company, Hudson, N.Y., and the LaFrance Engine Company of Elmira, N.Y. In 1856 the firm of Silsby, Mynders & Co. of Seneca Falls, N.Y., designed and built the first rotary fire-engine. This early machine was a very



SILSBY, 1860

crude production compared with the later and popular engine known as the "Silsby." Mounted on four wheels, with the boiler set in an upright position in the centre, there was a platform half-way up the side of the boiler, and the pump and engine set crosswise in the rear. This machine was equipped with the usual horse pole, but, the weight being so great, the horses were used for steering purpose only. The propelling power was furnished by a connection attached to



CLAPP &amp; JONES HORIZONTAL ENGINE

the rear wheels by a system of cog-wheels and belt, whereby the engine could be set in motion. In 1891 the American Fire Engine Company was organized by the consolidation of the Ahrens, Button, Clapp & Jones, and Silsby companies. The firm of Silsby, Mynders & Co., succeeded by Silsby & Co. and the Silsby Manufacturing Company, built from 1856 until 1890 a total of over one thousand steam fire-engines of successful design. The Clapp &

Jones Company of New York, N.Y., succeeded by Clapp & Jones Manufacturing Company of Hudson, N.Y., built and sold a total of about five hundred and seventy-five engines from 1862 until 1890. The Button & Blake Company, succeeded by L. Button, L. Button & Son, and Holroyd & Co., all of Waterford, N.Y., sold 229 engines from 1861 until 1890. These engines were commonly known as the "Button." The Ahrens Manufacturing Company of Cincinnati, Ohio, successors to C. Ahrens & Co., Lane & Bodley, and A. B. & E. Latta, also of Cincinnati, built an aggregate output of approximately three hundred engines. This consolidation was formed with the idea of uniting the experience

and mechanical skill of the several companies for the purpose of improving the building of fire-engines, combining the special patented features of the several makes in a machine containing such points of excellence and detail of construction as had proven successful in each. The company operated two factories, one at Seneca Falls, N.Y., the other at Cincinnati, Ohio, and continued as the American Fire Engine Company until 1900. The International Fire Engine Company was then organized, taking in the above companies and also the LaFrance Fire Engine Company of Elmira, N.Y. The LaFrance Company had conducted business from 1872 until 1900, and had placed upon the market 495 engines which had been known as the "LaFrance." The International Fire Engine Company continued the manufacture of engines until 1904,



LAFRANCE ENGINE

when they were bought out by the present American LaFrance Fire Engine Company. This company has been able, through the past experience of the various companies and by controlling many patents, to develop the well-known steam fire-engine "Metropolitan." This engine is now past the experimental

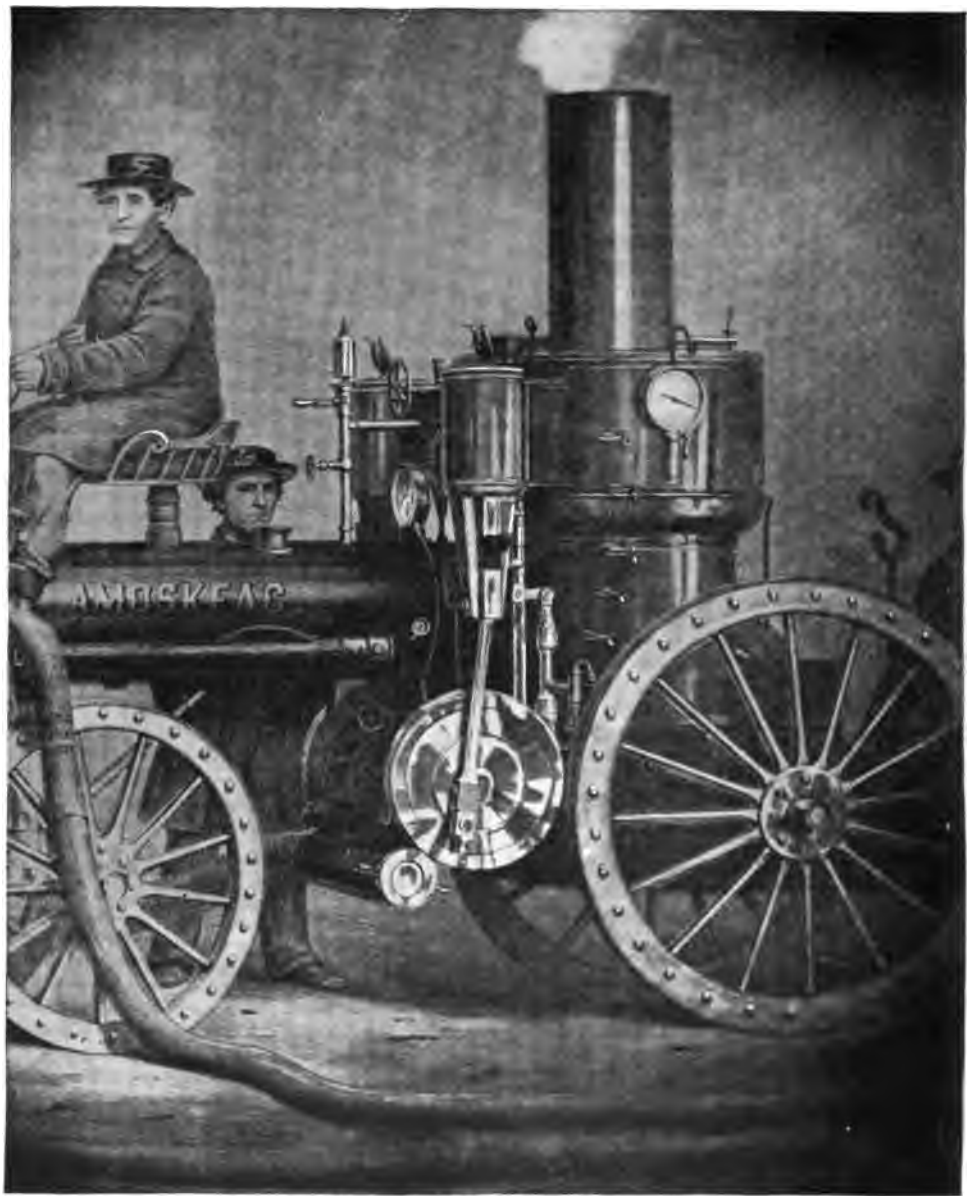
stage, and is to-day a recognized standard of steam fire-engine production. The company now operates the largest fire apparatus plant in the world, building a complete line of fire-fighting apparatus.



METROPOLITAN FIRE ENGINE

Another very popular fire-engine, known throughout the fire world and one which has been universally satisfactory, is the "Amoskeag." This engine was first made by the

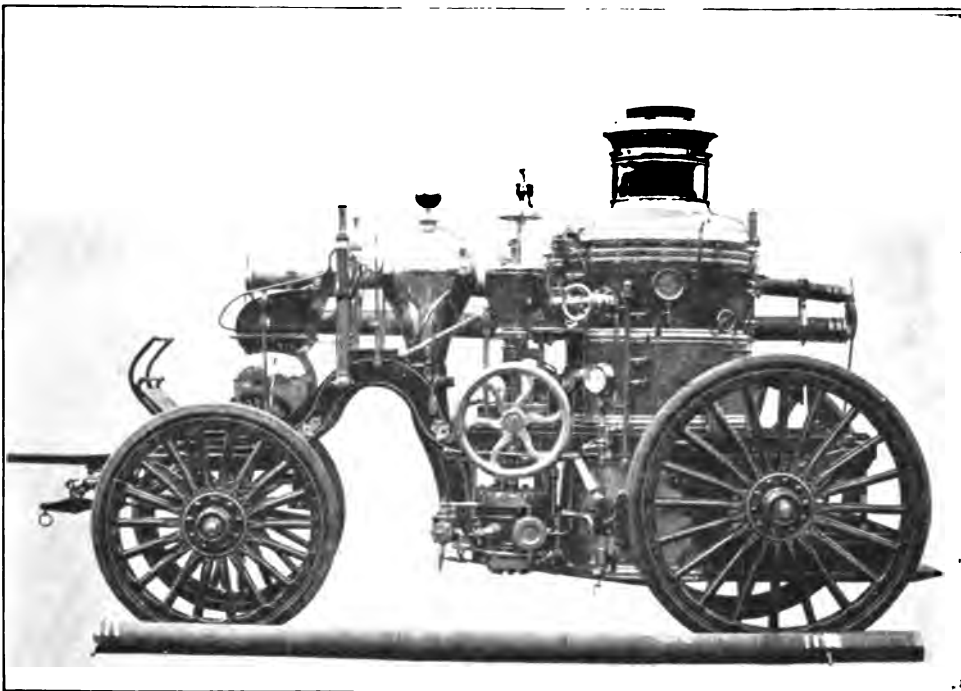
Amoskeag Manufacturing Company of Manchester, N.H., in 1859, succeeded by the Manchester Locomotive Works in 1878, and by the International Power Company of Providence, R.I., 1902. Famed for its building of locomotives, the durability of their fire-engines has received equal recognition and praise. While their first model was a decidedly undeveloped production, that engine, nevertheless, was sold to the city in which it was built, and performed good service for a number of years. There are to this day a



FIRST AMOSKEAG FIRE-ENGINE, BUILT 1859

few old "Manchesterites" who recall that funny-looking yet famous "Manchester No 1." The original type was a round pump, and the first ten engines manufactured were of this pattern.

That the Amoskeag was destined to become a worthy engine seems to be demonstrated by the fact that the first ten engines were sold between August, 1859, and March, 1860. In the latter year a Double Round Tank, also a Single "U" Tank, were constructed, and in 1861 the "Single Harp Tank" model was constructed. In 1866 a Double Straight Frame was used, and continued until early in 1870, when a Double Engine with Crane Neck Frame was introduced,



AMOSKEAG ENGINE.

using for the first time the open top or screw type of boiler, which was continued up to 1885. In that year the first Cone Top Boiler was used. All engines up to 1897 were connected with steam and exhausts inside of the boiler top. In 1885 the original Amoskeag plate pump, which had been used on all types of engines up to that time, was abandoned, and a new solid pump was cast, which was made of one casting of composition metal. From that time up to the present date the engine has been altered from the standard Amoskeag to meet the new conditions imposed upon fire-engines. In the past twenty years the engine has been altered in all of its general details to meet required technical changes and conditions. The solid and substantial yet simple con-

struction of the Amoskeag engine has won excellent favor wherever it has been used. There are many instances on record where these engines have been in actual service for over thirty years, requiring only such repairs as nature and general use compelled. The "horseless" or "self-propelled" Amoskeag engines are generally admitted to be the "acme" of this type of construction.

The first Amoskeag Horseless was sold to Hartford, Conn.

The longest recorded distance a fire-engine ever threw a stream of water, according to all authentic records which could be found by the writer after a



THE "HORSELESS."

careful research, seems to be due to former "Engine Six" (now Engine Two) of Cambridge, Mass. This engine is an extra first size Amoskeag, and, when delivered to the city by the manufacturers, was tested at Fresh Pond. At the test the engine played a stream of water three hundred and eighty-one feet, four and one-half inches, which play immediately gave to the engine the name of "Big Six," by which it was always known until transferred to its new station. The approximate output of the Amoskeag Company is about nine hundred engines, some of which are in use in distant lands.

The Nott Fire Engine Company, who build the fire-engine known as the

"Universal," and the Ahrens Fire Engine Company, who construct the "Continental," are equally successful and also well-known manufacturers. Their products are commendable models of mechanical and engineering skill, are all that could be expected in durability and strength, and have excellent indorsement from scores of experienced fire officials.

Among the many other makers of steam fire-engines the following will show some of the attempts to gain a market in this direction: Abel Sharvk, of Cincinnati, Ohio, built from 1855 to 1857 five engines. James Smith, of New York City, from 1856 to 1864 built about fourteen engines. Murray & Hazlehurst, of Baltimore, Md., from 1858 to 1860 built four engines. Poole & Hunt, of Baltimore, Md., from 1858 to 1868 built fourteen engines. Shepherd Iron Works, Buffalo, N.Y., in 1859 and 1860 built six engines. Reanie, Neafie & Co., succeeded by Neafie & Levy, of Philadelphia, from 1857 to 1876 built about thirty-three engines. John Agnew & Son, Philadelphia, 1860, built four engines. C. J. & J. L. Chapman, Philadelphia, from 1860 to 1864 built seven engines. James B. Johnson, succeeded by the Portland Machine Company of Portland, Me., from 1860 to 1868 built thirty-three engines. Ettenger & Edmond, Richmond, Va., from 1859 to 1877 built about five engines. William Jeffers & Co., Pawtucket, R.I., from 1861 to 1877 built about twenty-five engines. This firm was succeeded by Skidmore & Morse, of Bridgeport, Conn., who from 1877 to 1879 built five more engines. P. S. Skidmore & Sons, as successors to the latter firm, built one more engine in 1879. Joseph Banks, New York, N.Y., in 1863-64 built seven engines. William H. Van Ness, New York, N.Y., in 1864 built four engines. William M. Ives & Son, succeeded by John A. Ives & Bro., Baltimore, Md., from 1864 to 1874 built eleven engines. S. W. Landell & Co., Philadelphia, in 1865 built four engines. Cole Bros., Pawtucket, R.I., from 1865 to 1875 built about sixty-five engines. Gould Machine Company, Newark, N.J., succeeded by B. S. Nichols & Co., Burlington, Vt., from 1865 to 1869 built about seventy-five engines. Hunneman & Co., Boston, Mass., from 1866 to 1883 built twenty-nine engines. Jacob Haupt, Philadelphia, in 1867 built four engines. The Allerton Iron Works Manufacturing Company, of Naugatuck and South Norwalk, Conn., from 1868 to 1874 built about twelve engines. Richard Harrel, Paterson, N.J., from 1868 to 1876 built about thirty engines. Junkett & Freeman, Boston, Mass., succeeded by Union Machine Company, Fitchburg, Mass., from 1869 to 1872 built about seventeen engines. John N. Dennison, succeeded by Spawn & Dennison and Dennison Manufacturing Company, of Reading, Pa., from 1869 to 1883 built eleven engines. Knowlton & Hoops, Philadelphia, succeeded by Knowlton & Co., Sharon Hill, Pa., from 1873 to 1876 built seven engines. Allen Fire Department Supply Company, Providence, R.I., 1873 and 1874 built four engines. Cambell & Rickards, succeeded by George Rickards, Philadelphia, Pa., in 1885 built seven engines. Thomas Manning, Jr., & Co., Cleveland, Ohio, from 1886 until 1894 are said to have built twenty engines. In addition to these the writer has a record of over

fifty attempts at fire-engine making, which resulted, however, in each case with less than four machines ever reaching the market, and in a majority of cases the attempt was abandoned after one engine had been built. Owing to the time and capital which has been consumed in attempting and perfecting the steam fire-engine, it is logical to assume that no other form of fire apparatus will ever receive an equal amount of attention or financial speculation.

## CHAPTER VIII.

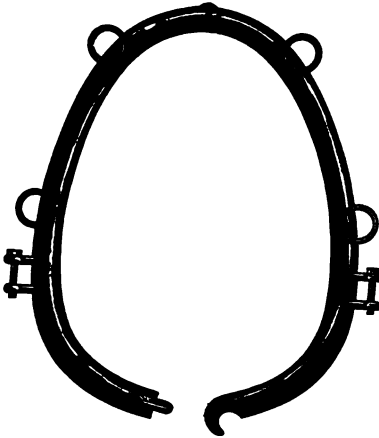
When the passer-by casts a glance into a fire station, probably the first object to meet his eye is the harness attached to the apparatus suspended from and spread out upon the hanger frame. If you have ever witnessed a company responding to an alarm, and noticed the "lightning-like hitch" and "rapid get-away," you have probably remarked, "Great work!" In the performance of this thrilling accomplishment have you ever considered the important part the harness plays? When an alarm of fire sounded previous to the year 1873, departments using horses were obliged to back them out of their stalls, and harness them in the ordinary manner before leading them to the apparatus. In some departments the collars were kept on (leaving nothing but the hames to be strapped), and the traces and pole straps to be fastened to the apparatus after leading out the horses. In the busiest fire-houses in some of the largest departments the horses during the day were kept constantly harnessed to the apparatus. In the first two instances much time was unavoidably lost, and in the latter instance the unsanitary conditions arising from the horses standing permanently on the main floor of the fire-house brought about the absolute necessity of inventing a ready means of hitching fire-horses, eliminating all disturbing hindrances and objections. In 1871 the first hanging single harness was arranged and used in the fire department



CHARLES E. BERRY, INVENTOR AND  
FATHER OF QUICK-HITCH FIRE  
HARNESS

of St. Joseph, Mo. About this time the first swinging double harness was placed in use in Allegheny, Pa. In both cases it was necessary to first put the collar on the horses. It was not until 1873 that these difficulties were overcome, when the foundation of the common swinging harness of to-day with its quick-locking hames, attached to a hinged collar, was invented by Charles E. Berry. Mr. Berry joined the Fire Department of Cambridge, Mass., in 1869, and in 1873 was assigned as relief engineer, in which capacity his duty was to report at the various fire-houses, to take the place of each man on a "day off." During these rounds of duty Mr. Berry had the opportunity to observe the various methods adopted for making a quick response to an alarm. In his department the horses were

kept harnessed in their stalls until 10 P.M. each day, when the harness, except the collar, was removed and hung behind each horse. When an alarm of fire was received after ten o'clock, the men would dress, go down-stairs,



FIRST QUICK-HITCH HAME,  
INVENTED 1873

harness the horses, lead them to the pole, and hitch them to the apparatus. In some houses it was necessary to back the horses out of the stalls, and turn them around to go through a door before leading them to the pole. To harness horses in this manner (strapping the hames together, putting the bits in their mouths, and then lead them out and hook them to the apparatus, often took two or three minutes. In July, 1873, while taking the engineer's place for a week at Engine Company No. 1, an unavoidable occurrence, which consumed more time than usual, brought forcibly to the mind of Mr. Berry the need of something which would eliminate the slow manner of hitching. He at once informed Mr.

Hiram Hooker, the driver of the engine, that he intended to make a hinged collar with quick-locking hames. As this was clearly a field for a new and original invention, Mr. Hooker at once encouraged the spirit, and was much surprised a day later when Mr.

Berry completed his idea. Two of these hames were made, and attached to the harness of the engine horses. Amid much wonder as to how his invention would work, Mr. Berry was called away on his rounds of relief. The next alarm, however, which called Engine 1, proved at once that a revolution had been started against slow hitches. Mr. Hooker, in responding to that alarm, threw the harness on the horses, the new hames locked at once and the trick was done, enabling him to leave the house in much quicker time than heretofore,

to the amazement of the usual onlookers. The act was particularly gratifying to him, and also to Mr. Berry, who at once began the construction of the



HIRAM HOOKER (Engine 1, Cambridge, Mass.)  
*First man to snap a quick-hitch collar in actual service*

excellent "Berry Hames and Collars," which, before many years, won for him the title of inventor and gave him world-wide fame throughout fire circles. Having patented his invention, he was at once besieged with so many orders for his product that it became necessary for him to leave the fire service, much to his regret. Since the introduction of his original "hames," Mr. Berry has completed and patented an improved model, which has been so successful that it has become generally used throughout the United States and many foreign countries. The general success and value of the quick-hitching harness has reduced the time consumed in leaving the firehouse from a matter of minutes to one of seconds. It is among the indispensable requirements of the fire service to-day. Mr. Berry is of the born fireman type, and, although advancing in years, thoroughly enjoys relating reminiscences, and enters upon all progressive matters relative to fire service with a display of that intuitive knowledge enjoyed only by practical veterans. With no previous models from which to work, Mr. Berry, while carrying to fulfilment this



LATEST MODEL QUICK-HITCH  
COLLAR AND HAME.

undeveloped requirement, displayed a particularly intuitive mind. It remained for one with a thorough knowledge and accustomed to the duties incident to a fireman's life to present such an accomplishment. Mr. Berry proved to be the man. Being a machinist and an engineer, many excellent unpatented improvements have been evolved by him and are in general use in the fire service of to-day. His advice on mechanical ideas is daily sought by his hundreds of firemen acquaintances, who for years have recognized and had faith in his excellent judgment. At his business office Mr. Berry has entertained fire officials from all parts of the country, and some years ago a party of foreign officials inspected with astonishment his excellent device for the rapid harnessing of fire horses. He possesses an honest, unassuming, sturdy, and conscientious character that one enjoys to meet in a "friend." The growth of his business has developed upon the principles of fidelity, integrity, and a painstaking impartiality. Mr. Hooker, who was the first man in the world to snap one of these quick-locking hames, is still hale and hearty at the ripe age of seventy years. He joined the Cambridge Fire Department in August, 1864, and was assigned to Engine Company 1, with which company he has always remained, and is at present assistant engineman. With an acquaintance of nearly half a century Mr. Hooker and Mr. Berry are now, as always, intimate and affectionate friends, and many a jovial story they enjoy in recalling the days of the early department and the introduction of the in-

vention of the crude hames, which later gave so much to the world in the progress of fire service. During his career as a fireman Mr. Hooker was considered by his associates a capable, fearless, yet careful driver, an accomplished engineer, cool and thoughtful in danger and a truthful and sympathetic comrade. In recognizing and giving honor to the generous contributors to fire-fighting apparatus, the name of Berry must and will be given precedence with those of Van de Heide, Braithwaite, Phillips, Channing, and Farmer.

Of recent date there has been more or less interest aroused by the introduction of gasolene fire-engines. The first impression generally is that this



GASOLENE FIRE-ENGINE AT STATION 6, BROCKTON, MASS.

particular form of engine is constructed in automobile type. These engines are drawn by a pair of horses, using gasolene only for the purpose of driving the pumps. Like all mechanical inventions, the gasolene engine of to-day is a decided improvement upon similar engines of a few years ago. The United States government has at the present time a number of stationary engines used for pumping and as a driving power for certain kinds of machinery, and a few portable engines used for search-lights in its coast defence. In proportion to capacities the gasolene fire-engines are about two-thirds the weight of steam fire-engines, are low-set, thereby giving easy access to all working parts, and in one respect are superior to the steam fire-engine in that they are not top-heavy. When the gasolene fire-engine will have become as dependable as the steam fire-engine has proven itself to be, there will then be a decrease

in the details requiring attention during the daily routine of work about the fire-house. The stationary boiler connected to the steam fire-engine for the purpose of keeping the water at a steaming point will then be discontinued, and the services of a "stoker" while the engine is at work will not be required. Another favorable point with the gasoline engine is that the suction inlet and discharge outlets for the hose are made on swivel attachments, making it possible to receive and discharge the water supply from either side of the engine, regardless of the position in which it may be placed. Gasoline is a convenient power adaptable to many uses, and the great progress made in the construction of automobiles during recent years has placed this form of engine in a position to be more generally understood than the steam engine. The horse-drawn gasoline engine for use in fire departments can hardly be expected to meet with any great favor. Owing to the rapid growth of nearly all communities, probably the first requirement of all fire departments is "speed." To gain this objective, the horse-drawn apparatus must be succeeded by auto-constructed machinery, combining the necessary self-propelling and pumping power. Up to the present time, however, the greatest difficulty has been experienced in producing an automobile fire-engine with pumps that would be successful in producing both propelling and pumping power. When at work upon a fire, the pumping power is a steady demand, while the propelling power is not always required at its maximum, slow speed or momentum often serving in its place. Therefore, to successfully operate the combination, special engines must be constructed. Much time and study has been given to the subject, however, and in the near future we can reasonably expect to see automobile fire-engines of practical design in successful operation.

The "high-pressure" or "direct service gravity system" has proven so thoroughly successful since its inauguration in several of the large fire departments that the future value and power of this form of fire service has gone beyond the experimental stage. This system wherever it has been installed has at once become the strongest and most powerful form of supplying water ever yet introduced into fire service. While the general system and means of pumping are hardly different from that of the ordinary city water supply, maintained by a central pumping station, the high-pressure service, aside from being so powerful against fire, is so constructed as to use salt water, which cannot be used in the steam fire-engines, and is also a great saving to the fresh water required for household uses. Especially constructed pumping stations, with pumps and machinery of tremendous power, force the water through large water mains to which are connected special sized hydrants. In general, these hydrants have connections for 3½-inch hose, which is 1 inch larger than the ordinary fire-hose. So terrific is their power and so great is their discharge of water that holders must be applied to assist the hosemen in handling and directing the stream. The first attempt to provide this form of water service as an additional means of better fire protection was probably first taken

up by the city of Rochester, N.Y. In 1874 the system was inaugurated, and since that year the plant has been improved upon in many ways, and is at present maintained in excellent working order, and is their strongest fire agent. Their present capacity consists of two three-million, one four-million, and two two-million gallon pumps. Steam and electricity supply the power, and the water mains are of cast iron. The hydrants have 6-inch to 8-inch inlets with 2½ and 3½ inch outlets. All large cities that have not heretofore installed a high-pressure service or have such in the course of construction are giving the matter



HIGH PRESSURE DEMONSTRATION IN NEW YORK CITY, SHOWING WATER BEING DISCHARGED AT A POINT THREE MILES FROM THE PUMPING STATION

much attention. The early means of this so-called Direct Pumping System was first supplied by fire-boats from the water fronts. Several cities have for some years had a system of pipes running through the business sections and equipped with what are known as salt-water hydrants. It was from the general satisfactory results of the work of the fire-boats that was evolved the question of a stationary plant with a more powerful form of pumping.

The city of Philadelphia beyond doubt has the best record for this form of fire-boat service. On one occasion there were maintained twelve streams with 1½-inch nozzles, connected to a system a mile and a half from the fire-

boat, with an average pressure of 180 pounds at the pumps. Four streams with 2-inch nozzles were similarly maintained, with a pressure of 237 pounds at the pumps. Under these conditions a loss in pressure of 47 per cent. in the first case and 34 per cent. in the second was observed from pump to hydrant in use. The average horizontal distance covered by the streams was 150 and 190 feet, respectively; while a single stream with a 2-inch nozzle played a distance of 315 feet horizontally and 230 feet vertically, with a pressure of 220 pounds at the pumps. Owing to the use of gas engines, the equipment of the highly efficient Philadelphia high-pressure service established a precedent in fire protection systems. Philadelphia's present system is supplied from a pump-



HOSE WAGON FITTED WITH STAND PIPES TO CONTROL HIGH-PRESSURE STREAMS

ing station located at the corner of Delaware Avenue and Race Street, and receives its water supply from the Delaware River, which is directly opposite. The water is forced through 20-inch distributing mains along the river front, which supply 12 and 16 inch mains extending into the business section. These are tied together in a network, at five points, by cross mains. The pipe network consists throughout of cast-iron pipes laid in 12 foot lengths, adaptable to a working pressure of 300 pounds per square inch. Cut-out valves at every corner or at intermediate points provide means for localizing any damage to the piping, thus avoiding the disuse of more than one hydrant. Each hydrant has two 4-inch outlets, to each of which manifold connections may be attached, supplying in all six lines of hose. The construction of this high-pressure power plant is interesting in many ways. The sub-foundation of the building consists of a solid concrete bed, five feet deep, which

is reinforced by a steel mat construction of 1-inch round rods, imbedded near the upper and lower surfaces of the concrete. The building foundations and engine piers rest directly upon this foundation. The maximum concentrated load upon the concrete bed is about four thousand pounds per square foot. The architectural character of the building, while simple, is of handsome and substantial design. The exterior is of dark red, smooth-finished brick, terra-cotta trimmings and window arches, with slate roof and copper monitor. The building is further conspicuous in the absence of a large chimney (owing to the use of gas engines). The engine-room is 140 feet deep by 68 feet wide, in which are located nine gas engines, seven of which are of 300 break horse power, and two small engines of 125 break horse power, making a total of 2,350. To each of the large engines there is attached a pump directly connected and delivering 1,200 gallons of water per minute, and to each of the small engines there is attached a pump delivering 350 gallons of water per minute. Each engine is of the vertical 3-cylinder cycle type, the larger ones of which weigh 90,000 pounds, and the small ones 35,000. The pumps are double-acting triplex plunger pumps, 11½ by 12 for the large pumps and 6½ by 12 for the small pumps. The large pumps weigh 49,000 pounds each, and the small size 25,000 pounds each. The fuel, "GAS," is obtained from a local gas company, and is well protected from failure of supply. Seven distributing stations of the gas company are connected to the pumping station in case of accidents to any one or more of the gas plants. Even should the gas-holders (tanks) give out at one or more of their distributing stations, gas can still be obtained by by-passing said holders. The gas supply to the station is drawn from a 30-inch trunk main, located 150 feet from the power station. A 16-inch supply main extends from the 30-inch main to the interior of the station, and is controlled by a street valve on the sidewalk at a distance of 140 feet from the station. From the 16-inch main there are 12, 10, and 8 inch pipes leading to the engines which are independently connected, thus enabling each engine and pump to be put out of service without interfering with the remainder of the plant. The starting of the engines is accomplished through the agency of compressed air, which is stored at 200 pounds' pressure. There are eight seamless tanks, fifteen feet long and sixteen inches in diameter, used for this purpose. All are connected by means of manifold or separate valves, thus permitting any number of tanks to be used, while the remainder can be held in reserve. On one occasion the nine engines were put to work with six tanks of air, leaving two unused. The value of the air system as a preliminary means of power will therefore be at once recognized. These tanks are supplied by two air compressors which are operated by two 125 horse power gas engines. There are three sources of current available for igniting the fuel supply, "GAS." Each engine is furnished with an igniter cabinet located near the throttle of the engine and controlled by switches. There is a 220 volt Edison current taken from street conduits which can be utilized and put through a rotary trans-

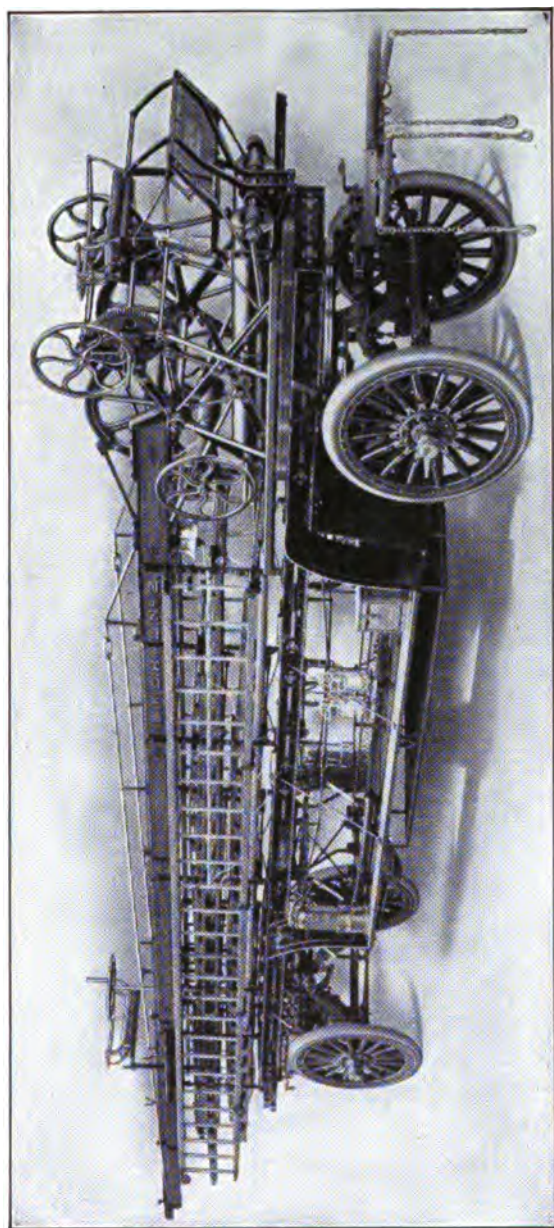
former. Second, a current can be supplied from a duplicate set of  $7\frac{1}{2}$  kw., 220 volt direct current generators belted to the small engines. This voltage is reduced to 110 volts by individual motor generators. A third source of current is received from cells of primary batteries which are located inside of each igniter cabinet. These currents are so arranged that the various currents cannot be thrown together. The water supply from the Delaware River is received through a 36-inch steel suction pipe which extends into the river seven feet below extreme low-water mark, the end of which is fitted with a rod screen. This suction pipe extends inside of the building and is connected to each pump. The following records must be kept daily by the engineers in charge of the plant: reading of gas meters three times a day, inspection of pumps, pressures and temperatures, and minutes of fire alarms, services, and general occurrences; electrical currents, igniters, pumps, and engines examined and each engine worked from five to fifteen minutes. The entire plant is worked once a week, the igniters frequently cleaned, all ignition currents tested at every fire, and compressed air tanks immediately recharged after starting the first engine. No unit of the Philadelphia high-pressure plant has ever failed to work when called upon, and not once has any unit failed to discharge its full capacity within one minute after starting. It is therefore apparent that the only means which would cause a failure on the part of this plant to work would be by a failure of the gas supply, and, as this has not occurred in Philadelphia for over forty years, the question seems unworthy of consideration. The Philadelphia pumping station was intended to equal the capacity of twenty steam fire-engines, and this has been accomplished with a further gratifying result that the entire plant is annually maintained at a total expense of \$2,000 less than the amount required for the maintenance of one steam fire-engine company of twelve men. Philadelphia, whose plant in many ways excels those of steam or electric power, also has the honor of being the first city in the world to establish an independent central power station, the entire and sole use of which is for fire protection. To protect this building from fire, should such occur in the large contiguous properties, a complete system of perforated pipes surrounds the building at the top, and is also placed over the roof. These pipes have an independent connection with the pumps inside the building, which, when supplied, furnish a complete solid sheet or blanket of water which envelops the entire building. Although not as large and powerful as some of the pumping stations which have been constructed in other cities, it is evident after careful observation that each and every detail was given sufficient consideration in keeping with their demands. As rapidly as is consistent, other similar stations will be installed in Philadelphia, thereby extending the high-pressure service throughout the larger part of their city.

Within the past few years the necessity of an individual water system for fire protection has become everywhere apparent, and probably all fire departments are considering how they may secure the installation of such a ser-

vice. It is apparent that many cities and towns, when establishing their public water service, gave little thought to the increasing demands of the future, and, as for the growing requirements of fire protection use, they were slightly considered, if in fact at all. During the last decade in the smaller cities two and three story buildings have given place to five and six story structures, and in the larger cities five and six story buildings have been razed and sky-scrapers constructed in their place. In both instances, population has rapidly increased, and all has caused greater demands upon the water supply, which in many cases was the last thing considered. The villages of a few years ago have become towns, and towns have grown to city size, yet with all this advancement the water supply in nearly every case has remained in its previous state. A water service established ten or twenty years ago has gradually become inadequate to give the required supply consistent with the growing conditions. Many communities have added engines and hose companies to their departments, and in many cases a serious fire has proven the water mains unfit to furnish a sufficient supply successfully to cope with the new condition. It has therefore become a recognized fact that fire departments and water service should advance together. To accomplish this result, the establishment of an independent water service for fire purposes only will gradually become of universal use. The high-pressure service is not necessarily confined to the cities having a large water front or to those situated near a river or lake. Even the smallest towns can realize such a service in an economical manner by the use of gas, gasoline, or electric stationary engines, connected to a system of wells. The excellent success which has been obtained wherever such systems have been installed foretells conclusively the ultimate popularity and general use of independent high-pressure service.

To keep pace with the new inventions of pumping engines, in supplying sufficient quantities of hose, and to meet such other requirements as the general fire service demanded, carriages or wagons for the carrying of hose and other equipment have steadily increased in size and utility. In many villages to-day the two-wheeled hose carriage is used in connection with hand-engines. The four-wheeled carriage drawn by hand and later by horse, and the hose-wagon which in detail bears little resemblance to its early construction, have advanced in their order. Although the present type of hose-wagon is frequently referred to as new and modern, this, however, is not true. The first hose-wagon was built by one Patrick Lyons, a mechanic of Philadelphia, and sold to that city in 1804. Therefore, this excellent invention, while of the express-wagon style of construction, is not an improvement of late years. While the wagon built by Mr. Lyons, which only carried a quantity of hose, is decidedly unlike the present wagons, some of which are constructed with chemical engines, stand-pipes, and many other late innovations, it is, however, to that gentleman that the credit is due of producing the first model of the hose-wagon.

The early designs of the hook and ladder truck, with the ladders piled



A MODERN TYPE OF AN "AÉRIAL LADDER TRUCK"

directly on top of each other and carrying a few unwieldy hooks, have been so far improved upon that the hook and ladder trucks of to-day have hardly any resemblance to the earlier patterns. The ordinary hook and ladder trucks, carrying their great loads of removable ladders of various lengths, have largely given way to the "aërial truck." The old style of solid, heavily constructed ladders is being steadily supplanted by the new trussed type of ladders, which are equally strong and very much lighter, making them more quickly and easily handled. The aërial truck since its inception has been developed by a continuance of new inventions until to-day it is a very interesting construction



ENGINE COMPANY NO. 6, UTICA, N.Y.

of fire apparatus. In the first designs the raising and lowering of the main ladder, which is supported directly on the framework and front trucks, was achieved by hand power. The method of raising and lowering these ladders has been greatly improved upon, and, where two or three minutes were necessary to do the work, at the present time, by the use of automatic appliances, even the longest of these ladders can be raised in a few seconds. One noteworthy means of quick raising is through the agency of compressed air cylinders, which by opening a valve forces the ladder to an upright position where it is automatically locked. Another system is by the use of coiled springs confined in cylinders, which, when liberated by automatic devices, raise the ladder almost instantly. The extensions in nearly every case are raised by levers.

The ladders are mounted on ball-bearing turn-tables, which enable them to be turned in any direction required. The aerial ladder trucks are also furnished with a supply of removable ladders, hooks, door-openers, ropes, and all necessary appurtenances. Owing to the extreme length of these ladder trucks, a steering device for the rear wheels was invented, and is operated by a system of gears attached to a turn-table. Connected to these gears is a large steering



WATER-TOWER IN ACTION AT A RECENT NEW YORK FIRE

wheel, which is handled by a man occupying a seat directly over the rear axle. This rear steering device relieves the driver from any responsibility for the back end of the truck, and permits its use in narrow streets and alleys heretofore impossible. It is also of incalculable value for travelling at a fast speed in congested or crowded thoroughfares. The aerial ladders are commonly made from fifty to eighty-five feet in length.

The manner of raising the standpipe of the water-tower has also been

improved upon by methods similar to those used in elevating the aërial ladder. The value of the water-tower in discharging large quantities of water, and its subsequent effectiveness, are daily demonstrated. The hose and discharge pipe are attached to a jointed steel lattice-work tower. The latest patterns of the water-tower are also equipped with turret or monitor standpipes of large size. They are supplied by several streams of water, entering into a reservoir, from which the water is discharged through the tower, or standpipes, with great volume and force. Since the introduction of the chemical engine large reductions in financial losses have been accomplished. In incipient fires and as a guard to surrounding property during conflagrations, the worth of the chemical



CHEMICAL ENGINE COMPANY NO. 1, CAMBRIDGE, MASS.

*This engine was presented to the city by Harvard University in the year 1880. Lieutenant James T. McCabe, who bears an excellent record for bravery and efficiency, is in command*

engine is invaluable. Unlike the large streams of water, there is very little water damage, or "drip," left from the work of these engines. The amount of fire which can be extinguished by the use of an ordinary chemical engine is astounding, and it is safe to say that its true value, even to this day, is not fully appreciated. There is hardly an instance where these engines are not relied upon for the initial form of attack by the bravest fire-fighters. Owing to the small size of the hose, a stream is easily handled by one man, and can be brought into many conditions where it would be impossible to carry a large stream. So successful has the work of a chemical engine become that nearly all modern hose-wagons and hook and ladder trucks are being equipped with one or two chemical tanks. In several cities which the writer visited he learned

that from 50 to 80 per cent. of fires were extinguished by the chemical fluid. Immediately upon arriving at a fire the chemical engine is ready for work, and its instantaneous operation has speedily overcome many threatening fires. Fire officials and insurance underwriters in general put great dependence in the ability of the chemical engine. The number of straight chemical engines, and the number of chemical tanks carried on the various fire-wagons in nearly all large cities, illustrate the value in which they are held. There are innumerable instances recorded in fire records where the early arrival and quick work of the chemical engine have absolutely saved handsome residences and business blocks. When the natural laws and elements of combustion become more thoroughly and intelligently understood, then the complete power of the application of chemicals to a fire will be appreciated in an unmistakable manner from actual experience.

Following these portable land engines, the next and even more powerful apparatus built for the extinguishment of fire is the "fire-boat." The fire department of all cities having a water front would indeed be incomplete, should it be without one of these formidable fire-fighters. These boats are fitted with the largest and most powerful form of pumps, and in addition to having connections for a number of land streams are also fitted with turret pipes and monitor nozzles, some of which have a discharging outlet of five and one-half inches. While these larger nozzles are connected to stationary pipes, they are nevertheless so constructed as to permit their use at any angle required. The pumps are installed in sets or groups of one, two, or three double-acting, vertical, duplex, or triplex pumps of the crank and fly-wheel type, and are simple or compounded, as desired. These pumps are so powerful as to have an individual discharging capacity of from nine hundred to three thousand gallons of water per minute. During the year 1908 three of these boats were added to the fleet of the New York Fire Department, making the fire-boat division number ten vessels. Two of these boats are of the steel screw-propelling type, and are the perfection of mechanical invention, and highly interesting in every detail, inasmuch as they are two of the largest and most powerful in the world.

Unlike the previous makes of fire-boats, these two, which are known as the "Thomas Willett" and the "James Duane," have entirely smooth or flush decks, thereby giving all the room possible for work. A description of the "Willett" is as follows: the hull: length over all, 132 feet; length on deck, 131 feet; length on water line, 123 feet; beam over all, 28 feet; beam moulded, 27 feet; depth moulded, 14 feet, 9 inches; crown of deck beams 27 feet, 6 inches; number of water-tight bulkheads, 4; draft forward, 9 feet; draft aft, 9 feet, 6 inches; tonnage, gross, 326 tons; tonnage, net, 222 tons. Built of steel in the year 1907.

The propelling engine is a two-cylinder, compound, inverted, direct-acting type; diameter of high-pressure cylinder, 18 inches; diameter of low-pressure cylinder, 38 inches; stroke, 26 inches; diameter of crank shaft, crank pins,



LAUNCHING OF FIRE-BOAT "THOMAS WILLETT" AT NEWBURG, N.Y., APRIL 16, 1907

THOMAS MARVEL, FIREMAN LUKE HENRY, Aid to Chief Kenlon  
ALEXANDER MILLER, Builders  
DEPARTMENT CHIEF JOHN KENLON, Commanding Fire-boat Fleet  
MR. ALBERT H. CROSS, Gamecull Fire Alarm Co  
EDWARD F. CROKER, Chief New York Fire Department  
DR. HARRY M. ARCHER, Department Surgeon  
CAPTAIN FREDERICK MURRAY, Fire-boat, "The New Yorker"

thrust shaft, and tail shaft,  $8\frac{1}{2}$  inches; diameter of line shaft, 8 inches; revolutions per minute, 200; propeller wheel of cast steel; diameter of propeller wheel, 8 feet, 8 inches; pitch of propeller wheel, 10 feet; weight of propeller wheel, 3,100 pounds; estimated horse power of engine, 800.

The two boilers are of the water-tube marine type, and the grate surface of each boiler is 64 square feet; the heating surface of each boiler, 2,250 square feet; the length of boiler drum, 11 feet; the diameter of boiler drum, 42 inches; the tensile strength of steel used in construction, 62,000 pounds; the pressure allowed by United States inspectors, 200 pounds; the number of 2-inch tubes, 452; the length of 2-inch tubes, 8 feet; the number of 4-inch tubes, 16; and the length of the 4-inch tubes is 7 feet. The fresh-water tank is located forward, formed by the hull under officers' room. Capacity, 6,000 gallons.

The fire pumps consist of two sets of two-stage centrifugal pumps, so connected that they can be operated as one four-stage pump. The capacity of the pumps when two-stage is 11,000 gallons per minute at 125 pounds' pressure, or 9,000 gallons per minute at 150 pounds' pressure. The capacity of both pumps, when running four-stage, is 4,500 gallons per minute at 300 pounds' pressure. Each pump is coupled direct to a 600 horse power horizontal Curtis turbine engine. The engines are of the radical flow impulse type. Each pump is supplied through a 14-inch suction pipe. The suction openings in ship's side are protected with a galvanized iron strainer, having 100 per cent. excess openings. The pumps discharge through a 14-inch discharge pipe, with a 14-inch branch to each turret on deck. There is an 8-inch branch running forward, with a 5-inch branch to nozzle on top of pilot-house and a 6-inch branch to nozzle on forward deck. A 6-inch branch runs aft to nozzle on water-tower.

Auxiliaries: A circulating pump, centrifugal type. Diameter of impeller, 36 inches; width of blade of impeller, 5 inches; diameter of steam cylinder, 7 inches; stroke, 8 inches; capacity of the pump, 2,500 gallons. Air pump of the vertical twin beam type. Diameter of steam cylinder, 9 inches; diameter of air cylinder, 18 inches; stroke, 12 inches. Main feed pumps of the vertical duplex type. Diameter of steam cylinder, 9 inches; diameter of water cylinder, 6 inches; stroke, 10 inches. One 10 kilowatt generating set, marine enclosed type. Diameter of steam cylinder, 6 inches; stroke, 10 inches; capacity of generator, 91 amperes. Basin pump of the horizontal duplex type. Diameter of steam cylinder,  $4\frac{1}{2}$  inches; stroke, 4 inches; diameter of water cylinder,  $3\frac{1}{2}$  inches. Sanitary pump of the horizontal double water-ended type. Diameter of steam cylinder,  $4\frac{1}{2}$  inches; diameter of water cylinder,  $4\frac{1}{2}$  inches; stroke, 6 inches. Donkey and auxiliary feed pump of the vertical duplex type. Diameter of steam cylinder, 9 inches; diameter of water cylinder, 6 inches; stroke, 10 inches. Blower engine of the vertical balanced type, connected to a sirocco fan. Diameter of steam cylinder, 4 inches; stroke, 6 inches; diameter of fan, 35 inches; length of impeller blades, 24 inches. Steering engine of the

direct connected, inclined cylinder type. Diameter of steam cylinder,  $4\frac{1}{2}$  inches; stroke,  $4\frac{1}{2}$  inches; gearing of crank shaft to cable drum, 4 to 1. One double-barrel capstan, steam and hand combined. Diameter of steam cylinder, 4 inches; stroke, 6 inches. One surface condenser. Cooling surface, 2,700 square feet; number of tubes, 1,480; diameter of tubes,  $\frac{5}{8}$  inch; length of tubes, 11 feet, 2 inches; length of condenser over all, 12 feet, 6 inches; diameter of condenser over all, 4 feet, 4 inches. One feed water heater. Heating surface, 180 square feet; length of heater over all, 8 feet; diameter of heater over all, 2 feet. Heating coils; 1 inch copper return pipe; two double tube injectors; two syphons; steam connections,  $1\frac{1}{2}$ -inch; suction, 2-inch.



"SHUTTING DOWN," FIRE-BOAT "JAMES DUANE"

The fire-fighting apparatus on the deck consists of the following: Two turrets amidship, each equipped with nine  $3\frac{1}{2}$ -inch discharge gates and one nozzle controlled by a 6-inch gate valve. It will be noticed that eighteen streams of water can be attached to these turrets, and may be taken ashore or played from the deck, as circumstances may require. One water-tower aft, 27 feet high above deck, equipped with one nozzle. The tower is stationary, and is of steel open-work construction, resembling in every detail the fighting towers lately introduced on battleships. At the top of these towers there is a space about four feet square to which the firemen mount when directing the stream. One nozzle on top of pilot-house; one nozzle on forward deck; brass fittings in rail every 10 feet for rail pipes; two large hose-reels for  $3\frac{1}{2}$ -inch hose; one reel for  $2\frac{1}{2}$ -inch hose; one chemical fire extinguisher; two fire axes; fifteen (15) buckets stowed in racks; and the necessary tools, consisting of various sizes nozzles, pipe-holders, rail pipes, etc., stowed in racks in nozzle-room.

The other apparatus consists of one metallic life-boat, 120 cubic feet, 16 feet long, 5 feet, 6 inches beam by 2 feet, 3 inches high; two life lines fastened to gunwales; one boat painter; one rudder; one boat hook; one bucket with lanyard; six (6) oars; four row-locks; boom for launching life-boat with necessary blocks, falls, and tackle; twelve (12) life preservers stowed in racks in convenient place; one anchor davit with necessary falls and fixtures; one 400-pound stockless anchor; twenty (20) fathom of anchor chain stowed in locker.

The pilot-house is equipped with wheel and standard for steam steering gear; a marine telegraph for transmitting signals to engine-room; speaking-tubes with whistles and electric call-bells for communicating with engine-room; small switchboard with buzzer and pilot lamps connected with signal lights; one liquid compass in compensating binnacle; switch and hand control of search-light; United States Rules and Regulations; set of nautical charts for East and North River, Bay, and adjoining waters; hand pulls for signal whistle and siren; fog-horn; bell; lead line; marine clock; and one 18-inch search-light mounted on top of pilot-house.

Scarcely ten years ago self-propelled vehicles were rare sights in this country. To-day, however, motor-driven wagons of all description, from the light runabout to the heavy commercial trucks, are in common use.

Possibly the first attempt in the making of a motor vehicle was by Captain Nicholas J. Cugnot, of the French Army, in 1769. This was a steampropelled wagon with three wheels, having a boiler and an engine overhanging the rear wheels; while the front wheel was devoted to steering purposes. Its general construction, it is evident, was similar to a velocipede or a tricycle.

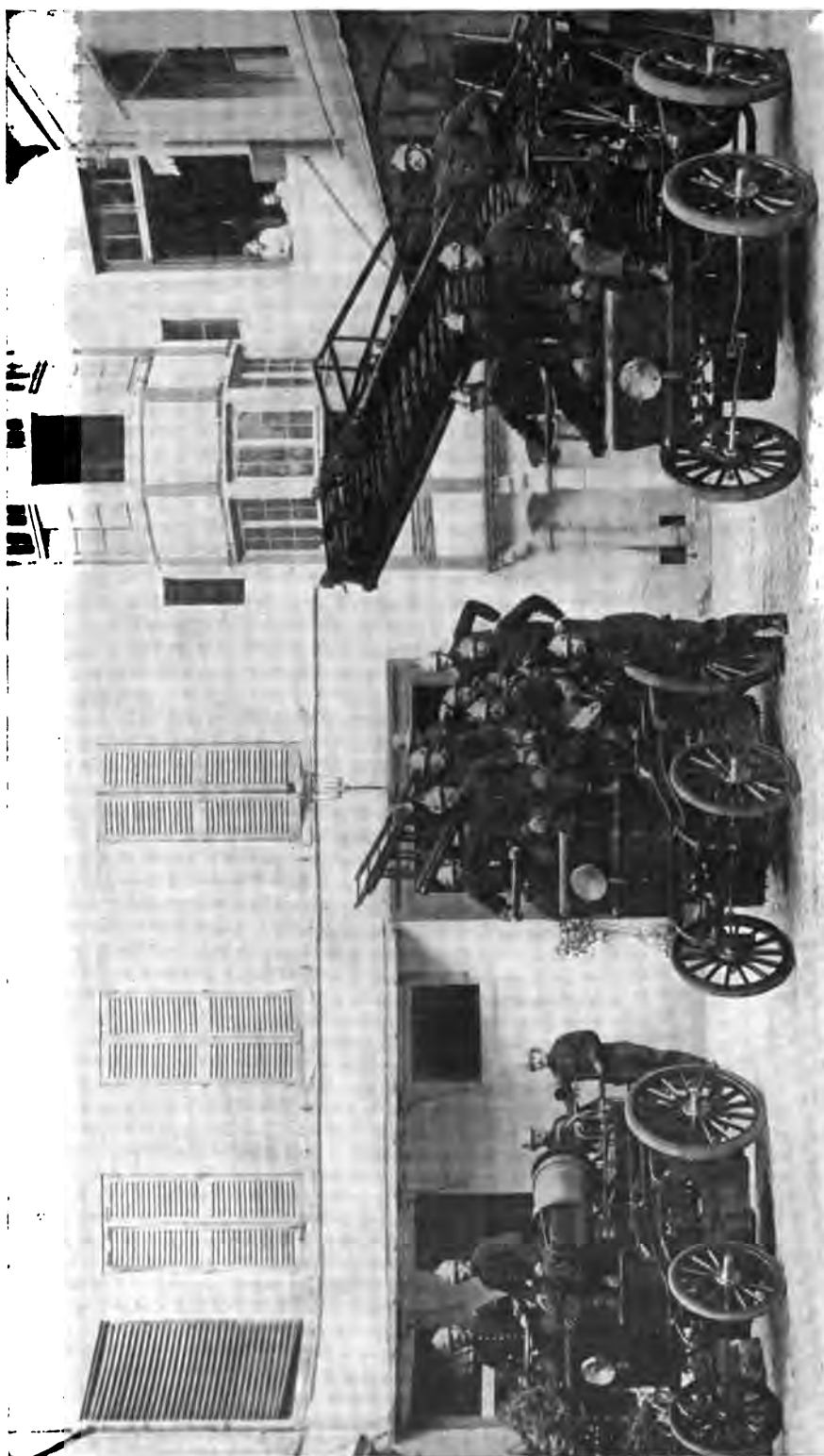
From 1840 to 1845 a number of attempts at making steam-propelled carriages were tried in England.

It might be assumed that the advancement of locomotive construction for railroad use was the foundation on which these later attempts were based. It seems fair to state, then, that automobile construction is not, as is often referred to, in its infancy.

The question to-day in the manufacturing of all auto-constructed wagons appears to be not "which one will do the work?" but, rather, "which one will do it the best?"

The excellent results obtained in many cities and the growing popularity of auto vehicles for fire use have already proven them to be the future forms of fire-wagons. Every form of apparatus heretofore horse-drawn is now being built under the self-propelled invention.

In company with Mr. Charles N. Perkins, of Lawrence, Mass., the writer had the privilege of inspecting the fire autos in the city of Springfield, Mass., and later witnessed the various processes through which this form of automobile passed while in the course of construction. Mr. Perkins is at present manager of the fire department supply division of the Knox Automobile Company, which fac-



THREE TYPES OF AUTO APPARATUS OF THE PARIS (FRANCE) DEPARTMENT

tory the writer visited. Pumping engines, chemical engines, hook and ladder trucks, combination wagons, and, in fact, all forms of various apparatus for fire use can now be obtained with self-propelling power.

The general objection and past impediments experienced in the making and use of the automobile have been gradually overcome.

The writer could not learn of a single objection to the use of auto fire apparatus in the many cities and towns which he visited. All departments already having such apparatus are highly enthusiastic over its use, while departments without it seem anxious for its installation. The orders received daily by the many manufacturers of fire automobiles strikingly illustrate the ever-growing favor and the ultimate general common use of auto fire apparatus.

Following the various advances for necessary appliances required by the conditions, for buildings and other public needs, and to insure as light a loss as possible from fire, many minds suggested introducing proper devices for the manufacturing of hose, which seems to have culminated in the cotton-jacketed hose which is so popular to-day. The early rubber hose, followed later by the leather-riveted hose, was discarded a number of years ago. The older firemen of to-day, however, will recall (perhaps with a jovial spirit) the greasy nature of the leather hose with its strap loops. Although adapted to the purposes for which it was constructed, leather hose required a large amount of attention, requiring oil or some preservative compound to keep it in a flexible condition. The hose of to-day, in all sizes, is most universally accepted as the acme of the latest production, with its cotton jacket, protecting many ply of fabric and rubber alternating. With the production of this form of hose the names of Cornelius Callahan, of Canton, Mass., and the late Robert Cowan, of Cambridge, Mass., are closely connected for their excellent suggestions, which have become widely adopted.

During the past few years the rubber hose has again come much in favor in many departments; and it is extensively used in a number of the large cities. Following the inventions which came repeatedly during the last thirty or forty years, shut-off nozzles of many commendable designs, all equally good in their work, have been invented.

To Mr. John Melavin, of Cambridge, Mass., an expert in the making of hose couplings and all brass goods pertaining to fire use, much credit must be given for his excellent ideas, which have found their way into many productions of shut-off nozzles that are used to-day.

The sprinkler system, extensively used at this time in factories and many other buildings, is an invention which has decreased fire losses to a great extent. This system comprises a series of pipes hanging a little below the ceiling, in every few feet of which there is a sealed block which becomes melted at a given degree of heat, and allows a large spray of water to be discharged. In many large cities, at the present time, buildings are equipped with a system of pipes with connections on the streets, to which hose can be attached and thereby a press-

ure of water may be forced throughout the building to openings at various points. This system is also arranged and connected to flood cellars in which dangerous merchandise is stored. This is commonly known as the "dry-pipe system," and is one which is of very commendable nature, having been the means, in many cases, of averting a large fire. With racks containing lengths of hose on each floor, an engine, or high-pressure service, may be attached to these connections on the streets; and the hosemen, without the burden of carrying hose up several flights of stairs, will at once have at their command a stream of water. The making of connections whereby several streams of water can be sent into one pipe to which extra size nozzles may be attached has become of popular use. These are commonly known as "Deluge Sets." Owing to the extreme pressure caused by these several streams, holders have been manufactured by which the nozzle can be controlled and directed at any angle.

The sprinkler system, combined with the dry-pipe system, has many times deluged cellars and sub-cellars so quickly and thoroughly that the beginning of a serious fire was quickly extinguished.

The modern make of fire-hats, the three-horse hitch for the heavier apparatus, the three and four way hydrants, have all advanced and sprung into use with the general progress of the requirements necessary to extinguish fire.

Within the last twenty years nearly all large cities have abolished the system by which call-men were in force, and have established their fire departments entirely permanent.

At the present time the fire service of America has advanced to a position which calls for momentary recognition. So ardent and interested are the American firemen of to-day that a score of journals, treating almost entirely upon matters of fire service, are published in this country. Among the best known of these journals are, probably, the *Fire and Water Engineering*, published in New York City, N.Y.; the *Firemen's Herald* of New York; and the *Firemen's Standard*, published in Boston, Mass. To these and many other noteworthy firemen's publications a large amount of credit must be given for their praiseworthy acknowledgment and notices of the general work of fire departments.

The firemen, in general, owe much of their advancement in many ways to the publicity which these journals have given to the general public regarding the needs and requirements of their service.

## CHAPTER IX.

While all large fire departments are more or less replete in interesting history from their beginning until the present time, it seems to the writer after careful consideration that the city of Philadelphia furnishes more interesting data, business-like administration, and a steadier display of progress than any other city when the fire service from the earliest to the present day becomes the topic. Since previous to the day when the boy gave word to "Grandpa" to ring for "Liberty" until the present time the hospitality of the "Quaker" city remains unchanged. Here is where the first law school was founded, where "Betsy" Ross made the first American Flag, where the United States



CHIEF JAMES C. BAXTER, PHILADELPHIA, PA.

established the mint that struck its first coin, where the first medical school in the country was inaugurated and where a public water service was first installed, where Ben Franklin founded the first public library and made the first demonstration of the relation of lightning to electricity, and where also the first volunteer hose company in America was formed,—a company which still exists, holding a direct lineage to the early organization. The total valuation of the city of Philadelphia is \$1,316,426,878, divided among a population of about a million and a half. Under the guidance, however, of James C. Baxter, Jr., chief engineer of the Bureau of Fire, this amount of property with its accompanying population is pro-

tected in a manner second to none in this country. A comparison of figures which glaringly illustrates the nearly perfect system of operation prescribed by the "chief" is the difference between the losses by fire and the whole value of properties immediately or actually endangered thereby, and the entire amount of insurance carried thereon.

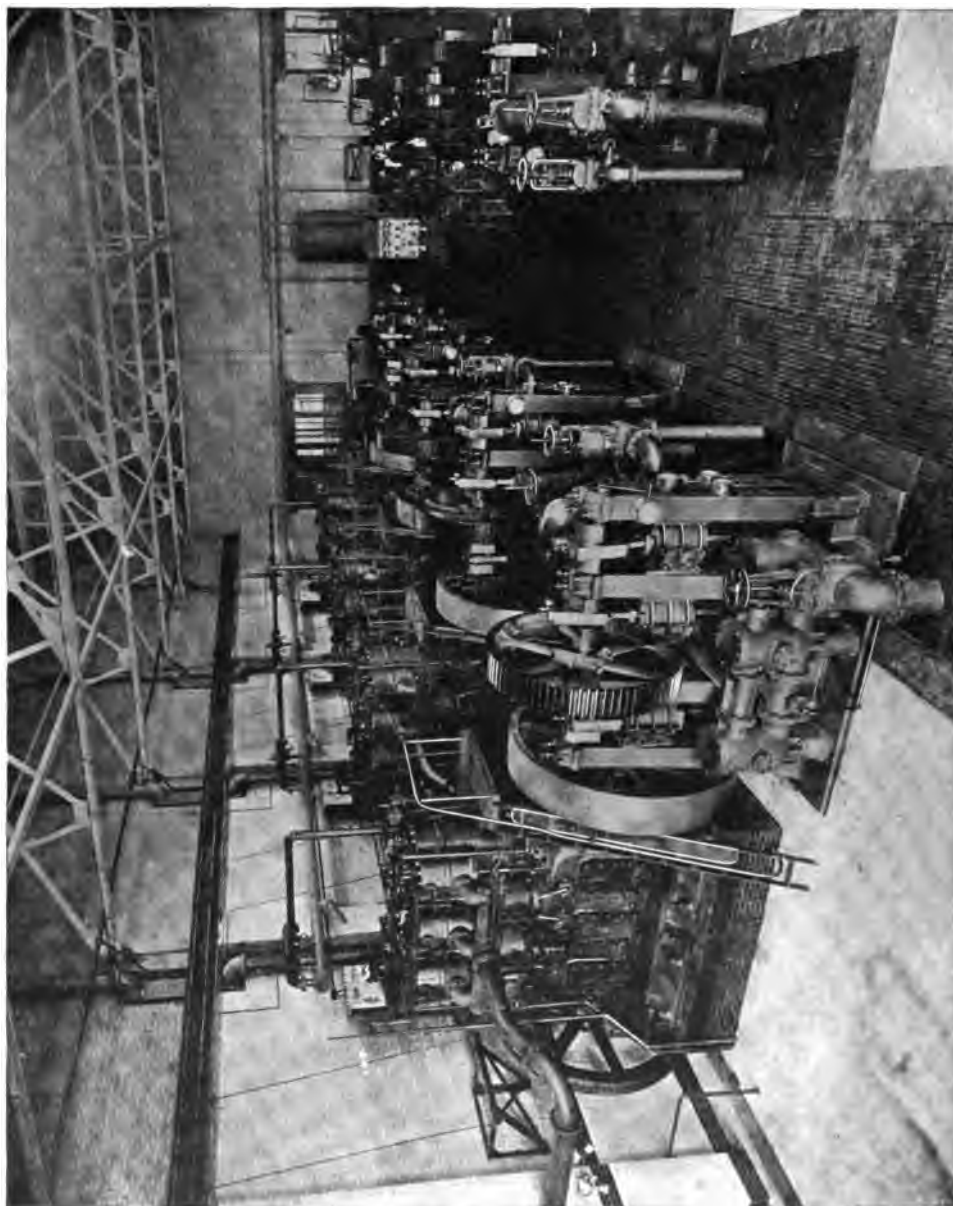
Chief Baxter is in himself a remarkable man. Trivial matters and the most important projects must alike receive his investigation and consideration. Minor details continually interrupt the solid business questions with which his executive ability wrestles. A serious struggle in the busy district stirs his blood, and in an instant his fire-fighting qualities are in operation. A seemingly hard task is cleverly won, the pathetically tragic ending of comrades wrings his heart; in the midst of all a keen sense of gentlemanly humor is noticeable, presenting even to the most intimate a question of the real nature which would be difficult to solve, yet leaving you, even after a short acquaintance, with the wholesome effects of having received kindly and fatherly advice from one whom you would hope to meet again. Considering the individual successes of Chief Baxter, he must be regarded and conceded to be the highest type of what a business man and chief should be. His measure has been taken on many occasions,—a measure which at all times has fully spanned the requirements. Philadelphia is fortunate in having for a chief one of so much intelligence, integrity, and courage, who for forty-six years has been a fireman and for nearly eighteen years chief. Well known throughout fire circles and respected by every one, the ability of Chief Baxter long since placed him on the roll of the leading fire chiefs of the day. With the first impression the most lasting and first love the strongest, this born fireman is content and satisfied to serve the city with which he has grown up. On the street, men, women, and children alike greet him as chief, indicating the establishment, old and new, of a true friendship and esteem. The chief is an ardent exponent of all suggestions intended to improve the fire service, and is a pleasant and interesting conversationalist on all progressive fire subjects, yet he is reasonably cautious about acquiring new inventions, believing that the "active" fire department is an improper place for the working of experiments.

Aside from the crowded conditions in the central part of the city, a visit to the various fire-houses reveals everything to be in excellent condition, men intelligently trained, and the horses and apparatus well kept, conveying instant evidence of a kind, progressive, yet strong, systematic, and observant leadership. Much credit must be counted when reckoning the value of Chief Baxter among the greatest fire chiefs. From official statistics of the ten largest fire departments in the United States for the past few years, considering extent of territory protected, losses *versus* liabilities, strength of department, and cost of maintenance, the title "One of America's Leading Fire Chiefs" seems by compulsion an addition to the nearly half-century of faithful, enterprising, and successful career of this man.

Chief Baxter is held in pride by city and State alike. He is intuitive and consistent, controls an abundance of sound sense, and cherishes the knowledge that he commands absolute honesty and confidence from subordinates and men, who regard him as a wise counsellor as well as chief. The general character, skill, and forethought possessed by Chief Baxter were indelibly

engraved upon the long list of his achievements at a fire in the Wanamaker Department Store a short time ago. This fire occurred during a crowded, busy hour, under conditions which particularly invited the many risks which accompany the danger of hundreds of men, women, and children becoming a distracted and panic-stricken mob. Arriving early upon the scene, Chief Baxter at once noted the dire possibilities which surround a fire breaking out in such a business building. Realizing at once what the outcome might be, should the cry of fire spread through the building, he hastily formulated plans to prevent such an occurrence. He at once acquainted himself with the conditions of the fire, gave instructions in a firm, decisive, yet scarcely audible tone to the firemen first to arrive, and then returned to the street. Here on-rushing apparatus was stopped as if its services were not required, further orders were quietly given, after which the chief stationed himself at the main entrance to the building, with an assumed attitude of utter disregard to the excitement that prevailed around him. His display of tact was wonderful. While his subordinates were equally quiet and careful in extinguishing the fire (lest the curiosity of employees and customers become aroused), the chief remained outside the building, splendidly acting the rôle of a disinterested spectator, and thereby overcame the possibility of a general rush of excited people, incident to a call of fire in a congested locality. His cool judgment at once removed the possibility of accident and injury to the thousands of people in and around the building, most of whom were not aware of the existence of a fire until it had been extinguished and the firemen were returning to their stations. Again Philadelphians rose up in their praise for "Baxter."

Under his command there are fifty-five steam fire-engines, with fifty-five combination hose and chemical wagons, fifteen aerial trucks, three city trucks, seven chemical engines, one water-tower, two cannon-wagons, one fire-boat. There is also an auxiliary of four police boats, which carry monitor nozzles and land streams. The chief has one assistant and ten district engineers. There is also a very efficient Insurance Patrol Service, which has three companies, and they have connected with their service a Reanie, Neafie & Co. steam fire-engine built in Philadelphia in the year 1858, which is still in active use and is brought into service in pumping water from cellars after a fire. The losses by fire in the year 1908 (3,759 alarms) was \$2,440,338, and the amount of insurance on the actually endangered property during the progress of those fires was \$62,082,375. One of the earliest high-pressure service stations to be established was placed in operation at Delaware Avenue and Race Street in the year 1905. Within this station there are seven large pumps, each having a capacity of 1,200 gallons of water a minute, and two small pumps with a capacity of 350 gallons per minute, all with a maximum pressure of 300 pounds to the square inch. The large engines are of 300 horse power, and the small engines of 150 horse power. These engines are worked by gas power, ignited by electricity, but the preliminary working may be started by the auxiliary of a large air



**HIGH-PRESSURE DIRECT PUMPING STATION, PHILADELPHIA, PA.**

*Interior View of One Side*

compressor and one small compressor. The air is stored in eight tanks. This gives an immediate starting service to the driving wheels, which is immediately taken up by the formidable power "gas." The high-pressure service covers practically all of the large business area of the city. When any box is sounded within the district, pumps are immediately started at a pressure of 100 pounds, and are held working at this point until telegraphic or telephonic communications are received from a chief or his aid, thereby assuring from the start at least a light pressure, which upon receiving said communication can be immediately placed at the maximum power available, should such be required.



HOSE CARRIAGE, PHILADELPHIA, PA.

This power would mean about ten thousand gallons of water per minute in addition to the working of the ordinary fire-engines. A recent invention installed by the assistant engineer, Mr. George Seddon, will immediately show any breaking in the pipe or hydrant service in this system by the continuous ringing of bells at the high-pressure station. A Bristle recording pressure gauge records the time at which the pumps start, the length of time in use, the amount of water used, and will immediately indicate an increase or decrease of pressure. It would be almost impossible for this system to fail to work (after four years of service such an event has not occurred), owing to the gas,

electrical, and automatic arrangements which have been installed by the chief and his assistant, and are in apparent perfect operation at the power station. This plant carries a force of twelve men, divided into two shifts. Another high-pressure station similar to the one now in use will soon be completed, further extending this powerful form of service. Looking backward from this latest form of fire service, one may also find in the Philadelphia department three of the old-time two-wheeled hose carriages (jumpers), which the crowded condition of some of the fire-houses has prevented being replaced by



WATER BATTERY, PHILADELPHIA, PA.

the modern hose-wagons. The "cannon-wagons" are an excellent addition to the general apparatus, having connections for the ordinary two and one-half inch hose as well as for the "high-pressure hose," which is three and one-half inches in diameter. Mounted on top, on swivel attachments, are two standpipes fitted with nozzles from two to four inches in diameter which can be trained in any direction desired, and, when supplied with water by several connections from the high-pressure system, might well be termed "a land fire-boat." These wagons are sometimes referred to as "Water Batteries,"—a name which seems to better describe the purpose for which they were constructed.

The manual force of this department is about one thousand men, and in addition there are civilian employees, divided as follows: thirty-five men employed in the repair shop, three headquarters clerks, three telephone and telegraph operators, and sixty-two cleaners of fire stations. The fire-alarm service, which is one of the best in the world, having during the past few years undergone a complete renovation, is fitted with the latest and best innovations known in the use of the fire-alarm telegraph. This department is maintained under a separate head, and designated "Electrical."

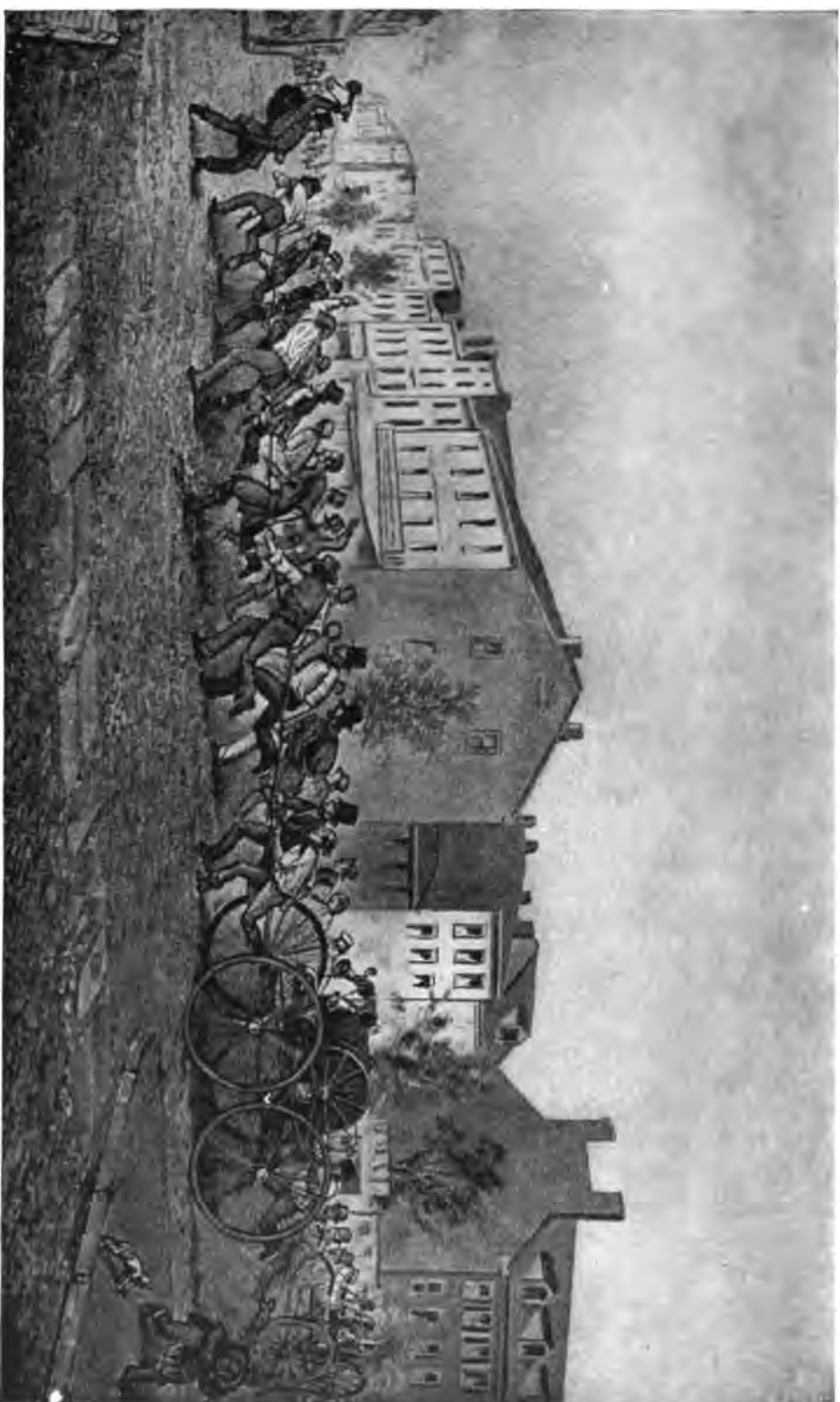
Like all large fire departments, the firemen of Philadelphia suffer from many accidents. To insure proper and immediate treatment, police patrol wagons, equipped with medical outfits and accompanied by surgeons, respond to all fires of more than one alarm and remain throughout the existence of the fire. A noteworthy incident, which illustrates the spirit of the officers, occurred on the evening of December 24, 1908, during a theatre fire. In one accident twelve firemen were overcome by heat, smoke, and gases, seven of whom were officers, including three district engineers. Among the latter was the late veteran Samuel Dunlap, who died three days later from the effects.

A sad event following the death of Engineer Dunlap was the suicide of Ladderman Harry Stever, of Truck Company No. 4. During previous fires these men had both been the means of saving each other's life. Upon learning of the death of his superior officer, Stever, who had been on a theatre detail, secreted himself in one of the dressing-rooms and ended his life by asphyxiation with gas. Stever's comrades had noticed the extreme melancholy mood which at once came over him upon learning the serious nature of Engineer Dunlap's condition. Although appreciating the unbreakable bond of friendship existing between the two men, Stever's comrades never expected the additional shock caused by his death.

Until March 15, 1871, the fire service of Philadelphia had always been performed by volunteer organizations. At that time there were forty-seven engines, 113 hose carriages, ten ladder trucks, and seven hand-engines. The number of active firemen was 2,993, and there were about sixteen thousand contributing and honorary members, which included many of the most influential and prominent men of the city. On May 25, 1695, the Councils of Philadelphia were petitioned to procure proper appliances for the extinguishment of fire, and in 1697 the first law was passed which directed that each house-keeper should keep convenient to access two leather buckets, also that the justices of the peace be empowered to procure hooks to be used in the tearing down of buildings in case of fire. In 1718 the first hand-engine was received, which was used until 1831. In 1730 two engines were received from England, and at this time there were also procured 250 buckets. In 1733 Nathaniel Nicholls, a resident of Philadelphia, built and sold to the city the first engine of home production. Through the efforts of Benjamin Franklin the Union Fire Company was established in December, 1736. Probably the

first engine to be regularly drawn by horses was the "Good Will" in 1803. The first hose company established in America was the Philadelphia Hose Company in the same year. The first steam fire-engine was installed in 1855, and known as the "Young America." In 1858 the first official supervision was given to the department, with Benjamin A. Shoemaker as chief engineer. The fire-alarm telegraph was completed in April, 1856, with 102 "alarm boxes." The office of fire marshal was also created in 1856. In December, 1870, an ordinance was passed authorizing the appointment of a board of seven fire commissioners, who were empowered to create and organize a paid fire service. On March 15, 1871, the volunteer department was succeeded by the paid department, which began operations with twenty-two steam fire-engines and hose companies of twelve men each, also five truck companies with thirteen men each, one chief, and five assistant chiefs. The first chief engineer was William H. Johnson, who for years had been a "volunteer." The present chief, James C. Baxter, Jr., was for many years a member of the Northern Liberty Hose and Steam Fire Engine Company. Upon the inauguration of the paid department he was appointed foreman of Engine Company 21, promoted to assistant chief in 1872 and chief engineer October 13, 1892. The fact that sufficient additions of men and apparatus had not been made in comparison with the growth of the city up to the present time reveals the achievements of this department to be highly commendable. In 1892, the first year of Chief Baxter, there were 1,531 alarms of fire, causing a loss of \$2,615,206 on buildings insured for \$18,166,068. In the year 1907 there were 3,591 alarms of fire with a loss of \$2,093,522 on property insured for \$61,132,775. These figures with those of 1908, which have been previously given, unmistakably present the significant up-to-dateness of Chief Baxter's fire-fighting qualities. During the administration of Chief Baxter the fleet of fire-boats has been established, the high-pressure service and water battery wagons installed, and many additions have been made in the manual and apparatus force. For many years serious fires frequently occurred among a series of large oil tanks located within the city. These fires generally burned themselves out, to the great menace of surrounding property, and caused a large financial loss by the oil destroyed. Under the direction of Chief Baxter a series of steam pipes were arranged to enter the tanks at various points, so that now, when one of these tanks becomes afire, the steam is turned on near the top of the oil, thereby cutting off the flames and leaving nothing to burn but the aeriform fluid remaining above the steam sheet.

Connected with the fire department there is a very successful and progressive "Benefit Association," organized for the purpose of useful relief among its members, and providing for the care of widows and orphans of deceased firemen. When the volunteer department was discontinued, nearly all of the active contributing and honorary members, each having a pride in the company to which he had belonged, formed themselves into veteran



HOSE RACE TO A FIRE IN PHILADELPHIA, PA., IN 1862, WHILE RESPONDING TO AN ALARM

organizations, nearly all of which still exist and hold regular meetings in sumptuous and well-fitted quarters which contain many interesting relics of the early fire-fighting days, and where visitors are always welcome.

On page 87 is reproduced a picture of an event which occurred in the fall of 1852. In response to an alarm given by the United States Engine Company, located at the intersection of Old York Road, 4th and Callowhill Streets, the Northern Liberty Hose Company "White Turtle" and the Lafayette Hose Company "Red Crab" met at the corner of Dillwyn and Noble Streets, whence they began a fierce race, which was finally won by the "White Turtle." This rare picture presents an excellent illustration of the rivalry existing between companies in all fire departments in the days of hand-drawn apparatus, and also the ready willingness and spirit of firemen in the days of the volunteer, when their pay consisted chiefly of "crackers and cheese" and an occasional tin dipper of coffee.

The fire department of the city of New York (the largest, most powerful, and busiest in the world) is in daily conflict with flaming structures and the subsequent tragedies incident to such an enormous municipality where all worldly dangers are unavoidably common. The total valuation of New York City is about twelve billions, divided among a population of nearly five millions. This vast sum of money and this army of souls are to a great extent intrusted to the care, ability, fidelity, and integrity of one man,—“the chief of the fire department.” A comparison of these figures must appall one with the responsibility for the welfare of these millions resting upon one man. Of the present official, Chief Edward F. Croker, much could be said. His untiring, unflinching devotion to duty, his firm, precise, unmoved demeanor, yet kind, sympathetic, and attentive to his department, have won for him the unsought though worthy respect of the populace and the admiration of his subordinates. Follow Chief Croker for only a few days through all the details resting upon his judgment (stopping frequently for a dashing auto ride to some “box” sounded within a danger zone), and enough could be gleaned to fill this book from cover to cover with a story replete in interest, thrill, and excitement. Upon being presented to Chief Croker, you at once learn by his cordial hand-shake that he is a man of excellent muscle. His frame of 5 feet, 9 inches, supporting its 190 pounds of weight, is moved about with the light and smooth step of a trained athlete. He is of athletic build, ruddy complexion, and straight as an arrow. His broad shoulders seem to defy the responsibility that rests upon them, his fine-shaped, well-poised head, and square chin indicate his grit and determination, while the steel-blue, piercing eyes are characteristic of keen perception and scrutiny. The stranger can but admire the commanding figure and general military physique. Under his command there are nearly five thousand men, whose duty it is to operate 166 steam fire-engines, 175 hose-wagons, sixty-eight aerial ladder trucks, twelve city hook and ladder trucks, ten fire-boats, and the largest “high-



CHIEF EDWARD F. CROKER, NEW YORK, N.Y.

pressure system" in the country. There is also a large corps of men detailed on specific duties, as well as a large force of civilian employees, "clerks, etc." At the fire department headquarters, located on 67th Street, in which is the chief's office, there are stationed Engine Company No. 39 and Truck Company No. 16. The fire-house furthest from his office is at Far Rockaway, and is thirty miles away. Thus the large territory under his command is better appreciated in figures, which are about two hundred square miles. With each day a new problem is presented. There is no end to the busy work of Chief Croker. The entire city of Greater New York is continually passing before him, like giant moving pictures. Chief Croker entered the fire service on June 22, 1884, and has advanced steadily through the grades of assistant foreman, foreman, chief of battalion, deputy chief of department, respectively, and was appointed chief December 23, 1899, which position he has since held, with the exception of about one year.

Probably the most marked feature in the ability of Chief Croker is his endurance. For months at a time Chief Croker has not enjoyed the pleasure of even a single unbroken night, yet, unless working on a fire, his office hours seldom vary, and at no time is there any portion or detail of the thousands of things dependent upon his office found undone. Speeding through the streets of Manhattan at an unlimited pace, often exceeding a mile a minute, and absolutely unaccountable to the traffic or speed laws, Chief Croker with his aid and chauffeur, responding in his automobile to an alarm of fire with its screaming whistle and furiously ringing bell, is a thrilling living picture which all witnesses recall with admiration. Not the kind of admiration which we pay for and then applaud when witnessing some dare-devil attempting to establish a new track record, but the complete, absolute, and wholesome admiration in which the nation holds all men, "particularly the firemen," who many times daily take their lives in their hands in the performance of the highest order of public-spirited duty.

The implicit confidence which New York firemen feel toward their chief was indicated to the writer by one of his assistants, who said, "The entire department of the Greater New York Fire Service is a capable and fearless body of men, yet at all times, when working on a hard fire, the task seems easier when we learn that the chief has arrived upon the scene."

Although thoroughly cognizant of the importance of his position, Chief Croker is noticeably free from frills or flourishes, and has a decided dislike for notoriety. The greatest interest of his life is beyond doubt his fire service, upon which subject he is a free yet decisive conversationalist, with apparently little or no regard to theoretical views, but with an abundance of sound sense on all practical developments. Although a courteous host, Chief Croker, with his busy career, has no time to give away, and the stranger, should he be fortunate enough to gain an interview, should prepare a slight nervous temperament or a timid nature against a seemingly light shock when the chief in a

pleasant yet emphatic manner rises from his desk, and remarks, "Is there anything further I can do for you?" To those acquainted, either officials or civilians, this remark is at once understood as a genial suggestion that his business with you has ended.

During the year 1908 over 20,000 alarms of fire were responded to, involv-



DEPUTY-CHIEF JOHN KENLON, COMMANDING MARINE  
DIVISION, NEW YORK FIRE DEPARTMENT

ing a possible property damage of about \$135,000,000, but were extinguished with an actual loss of about \$9,000,000. Nearly 2,500 horses are required for service in this department. Over 190,000,000 gallons of water were used by the fire department during the year 1908, nearly 80,000,000 gallons of which

was river water. The cost of running this department for the year 1908 was \$7,349,617.81.

There is probably no branch of the fire department so little understood as the fire-boat service. In the city of New York the fire-boat fleet is of uncommon and especial interest. It is not only the largest fire-boat fleet in the world, but is also the only division of this form of fire service having a commander whose entire attention is given to water-front protection. On January 16, 1905, the fire-boat service of New York was placed under a specific head, and Battalion Chief John Kenlon was advanced to the grade of deputy chief and placed



"RECEIVING AN ALARM." DO WE GO?  
*Side view of engine-room on "The New Yorker" fire-boat*

in command. When in action, Chief Kenlon may in truth be designated a "full-fledged fighting Admiral."

From his private launch, the "Velox," he signals to the different boats of his fleet in practically the same manner and with equally beneficial results as does the navy officer when in battle. At any time it would be justly pardonable for a stranger to mistake this fleet of boats for a gunboat squadron of the navy. They are indeed a tremendous water battery, equalling, as they do, the strength of about one hundred land steam fire-engines.

There is approximately 550 miles of wharfage and water front in Greater

New York, holding a value of about \$350,000,000. An average of thirty-one steamships arrive and sail daily. In 1908 over \$1,250,000,000 worth of merchandise was handled in the marine service on these wharves and docks, involving 60 per cent. of the entire imports which entered the United States during that year, and contributing nearly \$200,000,000 to the nation's customs and duties. The rapid growth of marine transportation and the great increase of exports and imports of Greater New York will be better appreciated, since the above figures show an increase of 80 per cent. during the last ten years. This enormous amount of business, with the scores of ferry-boats and their landings and the



RECREATION-ROOM AT STATION OF "THE NEW YORKER" FIRE-BOAT

hundreds of smaller craft which ply the waters of Greater New York, is at all times under the care of the fire-boat fleet. The inner New York Harbor and the North and East Rivers are not, however, the confines of the fire-boat service, for it is by no means an uncommon occurrence for the fire-boats to be called thirty or forty miles out to sea to assist some vessel whose cargo has taken fire.

The hardest kind of fireman's life is often experienced by Chief Kenlon and his hardy followers during the severe winter weather. As a guest of Chief Kenlon, the writer received the privilege of chopping the waves of New York Harbor to a point on Staten Island, a distance of nearly ten miles, in response to a three-alarm fire, and gained a slight knowledge of the innumerable de-

tails connected with such a fire-boat service. Upon landing and viewing the fire and surrounding property, it was easily noticeable that the powerful streams from the fire-boats had averted a small conflagration.

Deputy Chief Kenlon became a fireman in 1887, was appointed engineer of a steam fire-engine in 1892, was made assistant foreman in 1897, foreman in 1900, chief of battalion in 1903, which position he held until assigned his present command.

Chief Kenlon is conscientious, conservative, and capable, is held in high esteem by all firemen, and is a master of the position to which he has been as-



SUPERINTENDENT FREDERICK S. GROVES, NEW YORK FIRE PATROL

signed. He is an excellent mechanic, an expert engineer, is a pilot, and is deeply interested in an engineering school which has been inaugurated for the instruction of firemen in the mechanical, navigating, and general marine qualities required of members of a fire-boat fleet. The "Velox" is a familiar launch, and its commander is a conspicuous figure on the waters surrounding Greater New York. The docking and unloading of large vessels, the repairs on old piers and docks, and the construction of new ones receive his untiring, observant scrutiny. Their approaches and advantageous points of attack in case of fire are constantly under his observation. To one unaccustomed to the work-

ing of a fire-boat and lacking a knowledge of maritime law the writer realizes the difficulty of presenting in an intelligent manner the excellence of their service and the admirable undertakings of the Marine Division of the New York Fire Department.

In relation to the fire service of New York any story would indeed be incomplete, should the department of fire patrol not receive worthy recognition. Under the direction of the New York Board of Fire Underwriters this department is governed and maintained by Superintendent Frederick S. Groves and his assistant, Captain Jefferson M. Sandford, of Patrol No. 3. This department



*Photographed expressly for Bucket Brigade to Flying Squadron by J. H. Boozer, New York, N.Y.*

CAPTAIN JEFFERSON M. SANDFORD, NEW YORK FIRE PATROL

is a model of its form of service, and consists of ten companies (three of which are in the Borough of Brooklyn and under the direction of Superintendent B. C. Thorn). Seven of these are double companies, each having two wagons with double sets of horses. About two hundred and fifty men are required to operate this department.

When arriving at the fire, their first object is at all times to rush in with their covers, hanging them to shelves, and covering all merchandise and other property to protect it from water damage. They are a hardy, painstaking body of men, and their bravery is equal in all respects to that of the regular fireman. The double companies are located in the danger districts, and carry an average

of thirty men each. The apparatus, quarters, and equipment are maintained in a praiseworthy manner, which at once displays thorough discipline.

The writer responded several times to fires with companies of this department, and was at once impressed with the clock-like regularity with which every detail of their duties was entered upon and performed. During the year 1908 this department responded to 9,397 alarms, at which they performed an aggregate of 6,353½ hours of labor, spreading 19,837 interior covers and 1,965 roof covers.



CAPTAIN PETER N.  
CORNWELL, FIRE PATROL  
NO. 2

A somewhat suggestive and impressive feature of this department is their nightly inspection and roll-call. At a given hour the companies form in a double rank, and are faced toward the commanding officer, each wearing his belt, to which are attached a hammer and other small instruments. A junior officer then inspects each man and his individual equipment. When the inspection is completed, the roll of the company is called, during which time the men stand at "Parade Rest." As each name is called, the man answers, "Here," and comes to attention. After this the inspecting officer faces about and salutes the officer in charge, and reports, "The inspection is correct." He is then ordered



*Photographed expressly for Bucket Brigade to Flying Squadron by J. H. Booser, New York, N.Y.*

FIRE PATROL NO. 2. JUST AFTER LEAVING QUARTERS IN ANSWER TO AN ALARM

to dismiss the company, and gives the command, "Right face," followed by "Break ranks." Upon receiving the latter order, each man, including the inspecting officer, simultaneously raises his right hand, and upon the command, "March," brings his right hand down upon his left with one resounding slap. The writer learned that the foregoing feature was a time-honored custom throughout this department, and, while no particular explanation of this novel form could be ascertained, it seems reasonable to assume that the originator might have had in mind a pleasant manner of proclaiming a mutual and unani-



*Photographed expressly for Bucket Brigade to Flying Squadron by J. H. Boozer, New York, N.Y.*

FIRE PATROL NO. 2. NEARING THE "BOX" AND ROLLING SWIFTLY

mous "good-night," knowing that ere the morning arrived some of their department might fall a victim to their perilous work. Whatever its original object may have been, it is nevertheless strongly significant of a wholesome, fraternal spirit.

In connection with this department it may be interesting to know that Fire Patrol Company No. 4 on Monday, the fifth day of July, 1908, which was celebrated as the Fourth of July, responded to twenty-seven regular alarms of fire, and in addition its members extinguished a score or more of small fires within their district, of which no bell alarm was given. This is the largest

number of alarms responded to by an individual company during any one day, according to all authentic information the writer received.

In the borough of Manhattan alone about one hundred alarms of fire were responded to on that day.

Superintendent Groves is one of the most highly interesting firemen the writer had the pleasure of meeting during his travels. Mr. Groves entered the volunteer fire department of New York City August 19, 1859. On June 28, 1868, he was appointed a member of the Fire Insurance Patrol of the same city, and on December 4, 1882, he was promoted to the rank of captain, and assigned to Patrol Company No. 2. On May 2, 1899, he was selected as the superintendent of the entire fire patrol service, which position he has since held. On May 3, 1885, Superintendent Groves was presented with a gold medal by the New



FIRE PATROL NO. 2. "RETURNING," SHOWING A MOUNTED TRAFFIC OFFICER OF THE NEW YORK POLICE DEPARTMENT

York Board of Fire Underwriters for heroic service. Although nearly seventy-two years of age, Superintendent Groves is at all times in immediate touch with the duties pertaining to his office and also with the arduous work of his department when in active service. Every detail of his department receives his untiring and unfailing attention. His judgment on fire matters, particularly on those pertaining to fire patrol service, is constantly solicited, owing to his excellent and rare judgment, which has at all times been a strong characteristic during the long term of service which this venerable gentleman has devoted to fire department work.

The roster of the various fire insurance patrol companies in the United States, and the different names by which they are indicated, may prove interesting to the reader, and are as follows. There are other cities maintaining wagons simi-

larly equipped. The following list is only of those cities where this form of service is entirely maintained and under the supervision of the fire underwriters. It will be noticed that the New York Fire Patrol System, organized October 3, 1839, is the oldest in the country.

<i>City.</i>	<i>Name of Department.</i>	<i>When organized.</i>
Albany, N.Y.	Protective Department.	September 17, 1872.
Baltimore, Md.	Fire Insurance Salvage Corps.	July 4, 1873.
Boston, Mass.	Protective Department.	March 10, 1868.
Brooklyn, N.Y.	Fire Insurance Salvage Corps.	December 16, 1895.
Chicago, Ill.	Fire Insurance Patrol.	October 1, 1871.
Cincinnati, Ohio.	Salvage Corps.	November 16, 1886.
Duluth, Minn.	Salvage Corps.	February 1, 1895.
Janesville, Wis.	Fire Police Patrol.	March 17, 1855.
Kansas City, Mo.	Fire Patrol.	June 1, 1889.
Louisville, Ky.	Salvage Corps.	April 14, 1888.
Memphis, Tenn.	Salvage Corps.	May 17, 1893.
Milwaukee, Wis.	Fire Insurance Patrol.	December 1, 1886.
Minneapolis, Minn.	Salvage Corps and Fire Patrol.	October 15, 1895.
Newark, N.J.	Salvage Corps.	July 1, 1879.
New Orleans, La.	Fire Insurance Patrol.	March 20, 1873.
New York, N.Y.	Fire Patrol.	October 3, 1839.
Philadelphia, Pa.	Fire Insurance Patrol.	July 15, 1869.
Providence, R.I.	Protective Department.	February 1, 1875.
San Francisco, Cal.	Fire Patrol.	April 30, 1875.
St. Louis, Mo.	Salvage Corps.	July 4, 1874.
St. Paul, Minn.	Fire Insurance Patrol.	October 8, 1895.
Worcester, Mass.	Protective Department.	December 1, 1875.

The fire department of Boston, Mass., holds a particularly important place in the history of American fire service, and the record of this department, as a whole, as well as the individual achievements of its members, are of world fame. The "get-into-it" style of fire-fighting which characterizes Boston firemen has for years been a recognized standard of coolness, fearlessness, and intrepidity. The narrow and crooked streets with their connecting congested alleys and by-passages make the work of Boston firemen particularly and uncommonly hazardous and dangerous. There is probably no city in the United States having as many packed in, closely constructed buildings as Boston. Travellers frequently refer to it as the most difficult city in which to find their way about. Such a confusing condition is understood better by the firemen than any other class of people. The writer has many times witnessed groups of firemen laboring with scaling ladders from window to window, on cornices, or along fire-escapes in chimney-like alleys and driveways, under con-

ditions in which it would seem impossible to survive. Through compelling circumstances, Boston firemen are very often placed in more precarious positions than their brothers of a like calling in nearly any other city. That death does not invade the ranks of Boston firemen more frequently seems due to the divine judgment of "Him who doeth all things well."

Although 1678 is the year generally accepted in marking the advent of the first fire-engine in Boston (likewise America), it would seem from the interpretation of notes taken from historical records that the engine was installed previous to that date. Yet there have been no substantial data found that would decisively authenticate the claim. Thomas Atkins, a carpenter, was given charge of this engine, with power to select a body of men to operate it. Although legally constituted fire companies were not enrolled till some years later, this appointment secured for Mr. Atkins the undisputed title of "America's first fireman," as well as the "Father of American fire service." The subsequent record of this early engine passed through many interesting changes and designations, which culminated in the year 1858 with steam fire-engine No. 7, which is at the present time located on East Street, near the heart of the dry-goods, wool, and leather districts, and is therefore the direct descendant of America's first fire-engine company. It would seem that this first "hand tub," which is early referred to as the "Prison Engine," was housed in a small building on the land of the old prison (now the site of the old Court House), on Queen Street (now Court Street). Later the engine was known as Extinguisher 7 and Tiger 7, holding the latter name until the introduction of the steamer which took its place under the name of Lawrence 7, and was located on Purchase Street, where it remained until its removal to its present quarters in September, 1870. Lawrence No. 7 was a "Bean & Scott" production, and was the third steamer purchased by Boston, the two earlier being of the A. B. Latta and Silsby-Mynders make, respectively. During the years 1859-60 all of the hand-engine companies were disbanded, and steam fire-engine companies organized in their place. For a number of years, however, the hand-engines were conveniently housed and held as a reserve force. Since the inception of steam fire-engines, "No. 7" has been one of the most active companies in the entire city. It has always been located in the centre of extremely dangerous surroundings. It is the nearest company to "fatal box 52," which was rung for the big fire of 1872, the Thanksgiving fire of 1889, and many other large fires sounded from this box, which is located in one of the most dreaded districts of the city. Notwithstanding the unusual crowded condition of all of Boston's business sections and the unusual disadvantageous opportunities for attacking a fire, the work of this department at all times is deservedly worthy of the highest commendation.

The apparatus of the Boston Fire Department at the present time is as follows: forty-two steam fire-engines with adequately equipped hose-wagons, two horseless steam fire-engines, twelve chemical engines, twenty-two city

hook and ladder trucks, and five aërial ladder trucks, three water-towers, two fire-boats in service with one reserve boat, four chiefs' automobiles, and twelve chiefs' wagons.

The department has one chief, two deputies, and thirteen battalion chiefs, and about nine hundred uniformed men, and in addition there are about seventy-five civilian employees, clerks, fire-alarm operators, etc.

During the year 1908 3,910 alarms of fire were received, involving a property damage of \$27,890,160. The loss upon this amount was \$3,608,459. Boston at present has approximately 660,000 inhabitants, all of whom, it would seem, hold their fire department in particular pride. The matter of high pressure at the present time is receiving a large amount of attention. For some years, throughout a large portion of the business district, the city has maintained what has been termed a salt-water service. For this service special pipes and hydrants were installed, which are supplied by the fire-boats at the water front. This service is similar to that which was first adopted by the city of Philadelphia.

The Massachusetts Humane Society, in keeping with their general endeavor to recognize heroism, early established a system by which firemen performing exceptionally gallant deeds would be rewarded by the presentation of a beautiful certificate bearing the necessary data. The writer was fortunate enough to receive the privilege of reproducing a copy of one of these testimonials which was presented to James F. McMahon (at present lieutenant, commanding Hook and Ladder Truck No. 24). The testimonial was awarded to Fireman McMahon, and also to two others of his associates, for saving life at a fire which occurred on the morning of February 5, 1901, at the Chandler Building, No. 15 State Street. Three alarms had been sent in for this fire, and Fireman McMahon and his comrades mounted an aërial ladder, and, working their way along a cornice work, managed to gain an entrance through a fourth-story window. Groping their way about, they finally rescued a mother and son, who by hurried work in extending artificial respiration, and the prompt arrival of an ambulance which bore them to a hospital, were saved.

The Boston Fire Department is at present under the command of Chief James A. Mullen, who for thirty-seven years has been a fireman and has passed through the various grades of promotion, as his following record will show: volunteer fireman, 1872; call man, 1874; captain Engine No. 15, 1881; district chief, 1885; second assistant chief, 1897; assistant chief, 1901; chief, 1906.

There is no social, fraternal, or other function which can divert the mind of Chief Mullen from his fire duty. Precise, intelligent, commanding, and in every manner master of the situation, Chief Mullen is, nevertheless, possessed of all of the lovable, fatherly, and sympathetic qualities required of a public-spirited citizen. At the terrible conflagration in Chelsea, Mass., Chief Mullen personally conducted the operations of a large portion of his department, and through his hours of untiring labor added another to his previous long

list of fire-fighting achievements, and again demonstrated his ability as a fire-fighter under the severest of conditions. With the department (while in active duty) under the direction of Chief Mullen, the magnificent work of

# HUMANE SOCIETY OF MASSACHUSETTS,

INCORPORATED  
1791.



FOR THE PURPOSE OF PROMOTING THE CAUSE OF HUMANITY, THE  
PRESERVATION OF HUMAN LIFE, AND THE ALLEVIATION OF ITS MISERIES;  
AND OF GRANTING HONORARY TESTIMONIALS AND REWARDS FOR MERIT, COURAGE,  
AND PERSEVERANCE WHEREVER SHOWN, AND HOWEVER EXERCISED.

*At a Meeting of the Trustees of the  
Humane Society,  
held on the 5<sup>th</sup> day of April 1901  
It was voted to award a certificate*

*TO*  
**James F. McMahon**

*in recognition of the bravery displayed by him  
in saving life at a fire in State Street, Boston.*

*Delivered 5<sup>th</sup> 1901*

*Charles Warren President*

*G. Curtis Recording Secy*

*Entered and recorded in  
the honorary records of the  
Society. Libro folio*

CERTIFICATE PRESENTED BY MASSACHUSETTS HUMANE SOCIETY

ex-Chiefs Damrell, Webber, and Cheswell will ever be maintained, and Bostonians can give thanks for the integrity and fidelity of its fire department chiefs.

Probably one of the most remarkable escapes from what appeared to be certain death was the manner in which Assistant Chief John F. Egan escaped from the fire in Boston which occurred on March 10, 1893. During the progress of this serious fire Chief Egan went to the roof of the Brown, Durrell Building to open hydrants and other supplying services connected with the water protection of that building. While thus engaged, he was cut off from all means of



CHARLES COSGROVE, *Driver*

JAMES A. MULLEN, *Chief*

BENJAMIN W. WELLS,

LIEUT. JOSEPH WEBBER,

*Ex-fire Commissioner*

*Aide-to-chief*

escape except one: that was a heavy telegraph cable which stretched across Kingston Street to a separate building. In his anxiety to save his life, he threw his fire-hat to the street to attract attention. Aërial ladders were thrown up with all rapidity, but the mass of wires overhead prevented them from reaching him. With a portion of his clothing on fire, he immediately went to the edge of the building, and swung himself over to the telegraph cable wire. The cable swayed and swung with his weight, but he continued to draw

himself along hand over hand and leg over leg to the middle of Kingston Street, where he swung ninety feet above the ground. Had Chief Egan not been in such a precarious position, he would probably have left the Brown, Durrell Building hands first, but with the dangerous surroundings, unfortu-



LATE DISTRICT CHIEF JOHN F. EGAN

nately, his feet were foremost. Had the cable gone directly across the street, Chief Egan, with the distance he had travelled, would have gained the opposite building; but, unfortunately, the wire was on a long angle, and by the time that the chief was suspended above the middle of the street, notwithstanding that he had travelled a great distance (the width of Kingston Street), he was outdone in strength. Hose-wagons were backed in together to form a circle, standing on which were anxious firemen holding a life-net, should their brave leader lose strength and fall. Encouraging cheers were repeatedly given. A seemingly inevitable death awaited the brave fireman, should his strength entirely fail him and should he lose his grasp. He hung on for what seemed a long time, and only the grit and determination which he possessed saved him from a sure death. Fortunately, some unknown individual, who understood the uses of a rope and the various knots, was seen to appear on the roof of the Holmes Building. Fastening a rope to the cable from which Chief Egan was suspended, the cable was then sawed away, and the body was seen to gradually descend. "The cable has broken!" was the general cry throughout the thousands of collected people who were witnessing this unusual sight. Gradually, however, the cable came down until the end appeared over the eaves of the Holmes Building, and, as the cable sloped, Chief Egan began to slide with the slant, until his apparently lifeless body reached the point where the rope had been made safe to the cable. Unable to retain his deathlike grip any longer on this practically vertical pitch, he was grasped by willing comrades and carried to the street. This exciting escape proved no barrier to the strength or will of Chief Egan, for within a day or two he returned to his duties.

Chief Egan remained in the service until the fatal fire which occurred in a wool house on Merrimac Street in February, 1898, when he and five other members of the Boston Department met a tragic death.

The record of Chief Egan as a brave and fearless fireman will remain as a glowing tribute to his many valorous deeds, and also as a tribute to the intrepidity of Boston firemen.

In addition to the statistics of the largest fire departments of the United States, the following will give the reader an idea of the comparative strength of some of the strong fire departments in America.

The conflagration in Baltimore which exerted and tested the strength of that department brought out some ideas of its chief, George W. Horton, who is one of the most progressive fire chiefs the country has ever known.

This fire brought forcibly to the minds of the inhabitants of Baltimore that a fire chief of recognized ability, when presenting the needs of his department before the populace of the city, should be given due and reasonable credence. Chief Horton is known among the class of men of rare good judgment when matters pertaining to his responsibility are to be considered. The fire department of Baltimore to-day is in excellent condition, and it is in detail pertaining to fire department matters complete, and valued accordingly.

There are in Baltimore thirty-three steam fire-engines with thirty-three combination hose and chemical wagons as tenders, twelve aerial ladder trucks, five city hook and ladder trucks carrying small chemical engines, two water-towers, two chiefs' automobiles, and one fire-boat. The total number of the uniformed force is 648, with about a score of civilian employees. The city has an area of about thirty-three and one-half square miles and a population of nearly eight hundred thousand. During the year 1908 there were 1,475 alarms for fire. The city has an excellent water service, connected under an especially arranged reservoir system, which has given commendable service since the year 1825.

The Salvage Corps Department is finely maintained, and consists of three stations, one of which has a double company, giving this department a strength of four wagons with about fifty men.

Chief Horton has many times been honored by excellent tributes, not only from his city, but from the State of Maryland and the Nation, in recognition of his ability. His ideas in all fire matters are always progressive without show or flourish, and at all times to the practical working order for the extinguishment as well as for the prevention of fire.

Following the earthquake in San Francisco, the need of a newly equipped fire department, and provision for protection against fire, devolved largely upon the venerable chief, Mr. P. H. Shaughnessy, and his two assistants. With a form of manhood seldom displayed, Chief Shaughnessy, during the trying hours to which his city was subjected, may well be congratulated, and forever



CHIEF GEORGE W. HORTON,  
BALTIMORE, MD.

known as father of the situation, notwithstanding the adverse circumstances into which he was so suddenly drawn. There was no time at any minute of the day when he was working without his recognized ability, strength, and fortitude. "Well Done Indeed," was the head-line of the papers throughout the country in recognition of the work of this grand old fireman. Chief



CHIEF P. H. SHAUGHNESSY,  
SAN FRANCISCO, CAL.

Shaughnessy at the present time has under his command thirty-eight steam fire-engines with their accompanying hose-wagons and a reserve force of thirteen engines, all in condition for immediate use. He also has nine chemical engines, one aërial hook and ladder truck, twelve city hook and ladder trucks (nine of which are in daily service and three in reserve), one water-tower and one reserve, and two modern fire-boats which are in the course of construction and about to be placed in commission. The chief has an automobile. There is a uniformed force of 570 men with about the same number of civilian employees, the larger part of whom may be designated as a "call force" of firemen.

During 1908 1,146 alarms of fire were attended. The city has an area of about twenty-eight square miles, in which there is a population of nearly five hundred thousand, and at the present time holds a valuation of about four hundred and sixty millions. High-pressure water service is now being installed.

The contemplated tour of Chief Shaughnessy through the United States will, upon his return, insure San Francisco, as soon as appropriate equipment can be acquired, with a fire service equal to its former one, and well within the bounds of the fine ideas of this venerable chief. A salvage corps of three stations, one of which is a double company, is also finely maintained, and their work is well within the average commendations due this form of service.

Under Chief James Horan, of Chicago, Ill., the fire department is at all times excellently maintained, and shows good records from year to year, which are always commendable. Chicago has 111 steam fire-engines and hose-wagons, two separate hose companies, thirteen chemical engines, fifteen aërial ladder trucks, nineteen city hook and ladder trucks, one water-tower, four fire-boats, and three chiefs' automobiles.

Chief Horan has twenty-two assistant chiefs and a total uniformed force of 1,800 men.

The year 1908 shows an aggregate of 10,811 alarms, during which \$72,044,810 worth of property was in danger, but the fires were extinguished with a loss of \$3,873,444.

The total valuation of the city of Chicago is approximately \$3,181,269,323, and the area of the city is nearly a hundred and ninety-one square miles, in which there is a population of about two million, two hundred and twenty-five thousand. There are eight fire patrol wagons in connection with the insurance work. The water pressure, at the present time, for the fire service is received from the fire-engines, but high pressure is being considered.

In Cleveland, Ohio, Chief George A. Wallace has under his command a department which performs very commendable work. In this city there are thirty steam fire-engines with their hose-wagons, four separate hose companies, four chemical engines, seven aerial ladder trucks, four city hook and ladder trucks with a reserve force of two trucks, one water-tower, two fire-boats, and an automobile for the use of the chief. The chief has eight assistants and a uniformed force of 518 men.

In 1908 there were 2,300 alarms of fire, involving a possible property loss of \$7,250,373.50, which was adjusted, by insurance paid, for \$829,251.98. The area of the city is about forty-one square miles, and the population is about one-half million.

A high-pressure service was installed for fire department use in 1885, therefore both high pressure and gravity are at present used. The high pressure has been installed through the commercial districts, and at the present time is supplied by the fire-boats.

Under Chief C. E. Swingley the city of St. Louis, Mo., is conducting and maintaining an excellent fire department, with about eight hundred uniformed men, eleven of whom are assistant chiefs. There are in operation forty-five steam fire-engines, accompanied by combination chemical and hose wagons. There are also nine aerial ladder trucks, seven city hook and ladder trucks, and two fire-boats. 3,315 alarms of fire were sounded during the year 1908, involving a loss of \$14,079,544. The good work of this department, however, extinguished these fires with an insurance loss of only \$1,094,375. The area of the city is about sixty-seven square miles: the population is about seven hundred and fifty thousand. There are three fire patrol companies, equipped in accordance with such departments throughout the country. The water pressure is of straight gravity, and the higher pressure is supplied by the use of the steam fire-engines.

Since the inception of the fire department of Newark, N.J., in 1797, its historical statistics are highly interesting. On January 26 of that year the department was organized with one hand-engine company. From that day until the present time Newark has steadily advanced its fire service, meeting all

necessary requirements in time to keep the department in adequate circumstances under ordinary conditions.

In 1901 all of the apparatus, amounting to some seventy pieces, was equipped with rubber tires, thereby making that the first department in the country to be entirely so equipped.

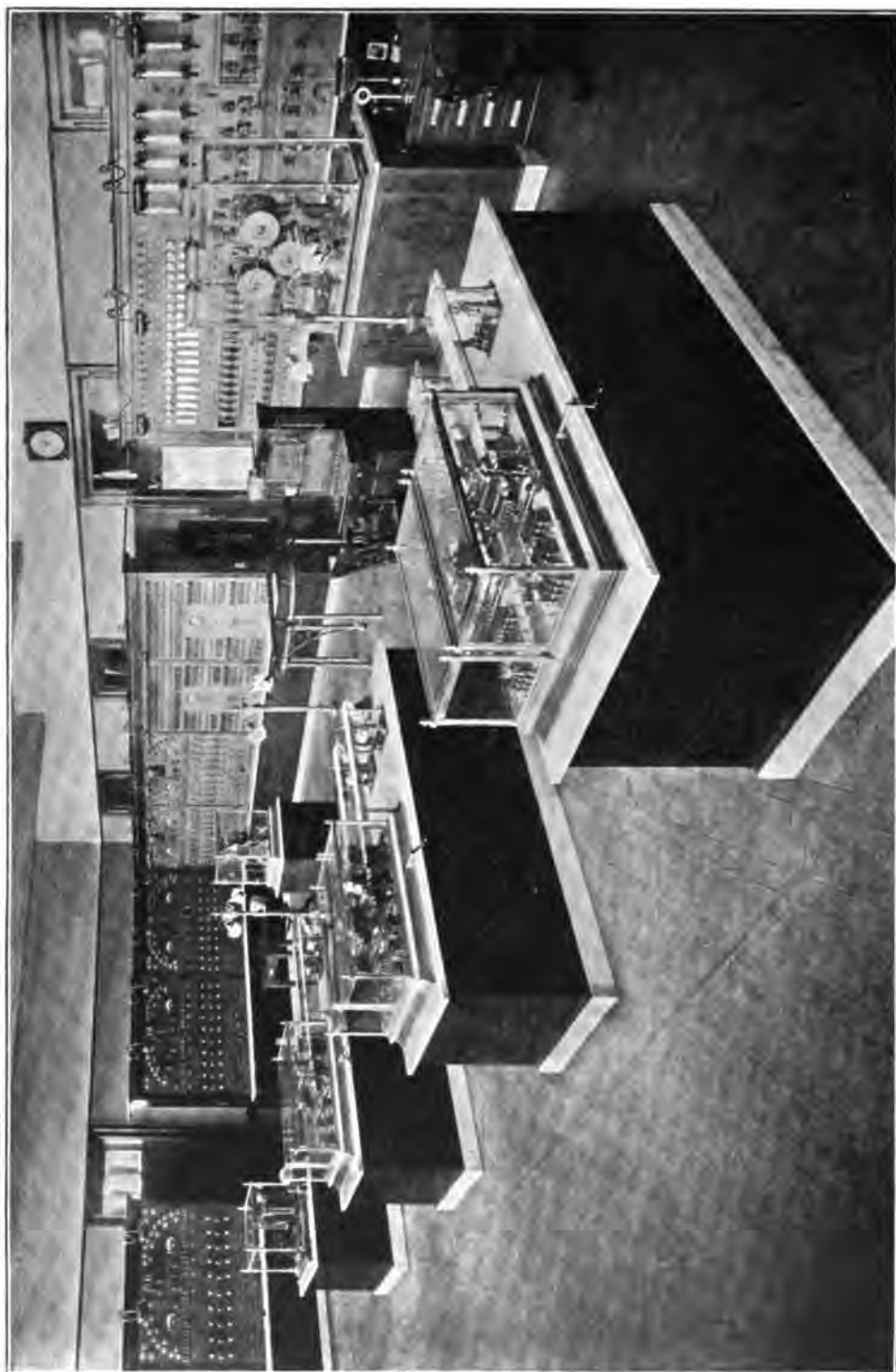
The water service of the city is among the best in the country, having at all times a pressure averaging over one hundred and fifty pounds without the use of pumps or engines. A generally interesting and particular feature in this department is the training of their horses, a portion of which insures the best sanitary conditions possible, particularly in a number of the fire-houses in which there are eight and ten horses. The horses are so trained that at certain intervals in the day they are released from the stalls, from which they back out and go to an especially assigned place in the rear of the stable, where they discharge their physical necessities.

Another highly interesting branch of the department is the fire alarm telegraph service, which is conducted by Superintendent Adam Bosch, who is not only the oldest fire-alarm operator in the country, but is also the longest service superintendent in active duty. In 1907 a new central office system was installed in the new City Hall, and it is invariably pronounced by experts to be one of the finest in the world. The operating-room is equipped with six to ten circuit alarm-box registers, one ten-circuit small bell register and one ten-circuit large gong register, one four-plate three-dial transmitter for sending alarms to the fire station, one automatic line tester, one 100-connection telephone exchange, and all the other necessary apparatus for testing wires and batteries. The battery-room is equipped with a double set of storage batteries of modern type. Connected with the central office there are over four hundred alarm boxes (nearly all of the modern non-interfering type), thirty-one engine-house electric outfits, a number of large gongs on street crossings, and many other important appliances.

Every precaution has been taken to render all portions of the equipment fire-proof.

The interior wiring consists of about sixteen miles, all of which is in metal conduits. The battery-room has a cement floor, and is supplied with steel racks which hold the glass jars. The room is spacious, and contains enough of these steel racks to install, as time may require, nearly twice the number of batteries that it at the present time contains.

The fire department in general is in excellent condition, and is at the present time under the command of Chief William C. Astley. Fire officials, as well as representative business men, speak of their department with much pride. The manual force of the department is about four hundred. The apparatus is as follows: twenty-one steam fire-engines, nineteen combination chemical and hose wagons, three hose-wagons, five city hook and ladder trucks, two aerial trucks, one water-tower, seven chiefs' buggies, and the necessary wagons



FIRE-ALARM TELEGRAPH HEADQUARTERS, NEWARK, N.J.

for the telegraph department and exercising purposes. There is a reserve force of three engines, two hook and ladder trucks, two chemical engines, and one buggy.

During the year 1908 1,179 alarms of fire were received, involving a possible loss to property of \$6,665,385.30. The loss, however, amounted to the commendable sum of only \$561,384.50. The population of Newark at the present time is, approximately, 314,000, and the total area is about twenty-two square miles.

The Salvage Corps is in keeping with all well-trained and well-equipped



SALVAGE CORPS COMPANY, NEWARK, N.J.

companies, and has in its service one two-horse wagon and one automobile. This department is under the command of Superintendent Henry S. Martin.

While the executive officers and influential citizens of Rhode Island are continually planning with enterprising spirit the betterment of the commercial, shipping, and other industries, it is evident from the records of the fire departments of this State that that service is at no time overlooked. From the smallest town to the city of Providence all of the fire departments are generously provided, and the apparatus and men are qualified and adapted for their duty. Presiding over the Fire Department of Providence is Chief George A.

Steere, who since the year 1852 has been a fireman, and for twenty-five years has held his present position. The manual force of his department is about three hundred and fifty men.

The valuation of the city is nearly two hundred and fifty million, and was endangered during the year of 1908 by 1,395 alarms of fire. The amount of insurance carried on the property endangered by these fires was \$8,436,-818.72. The actual losses were \$571,931.16, of which there was adjusted \$521,614.02, the difference showing the amount of loss on uninsured property. The population of Providence, R.I., is about two hundred thousand, and it is safe to state that no city, large or small, holds a greater amount of thorough pride for its fire department. Providence is quick to grasp all energetic ideas and install modern appliances intended to advance the efficiency of the fire service. The board of engineers is comprised of one chief, one deputy chief, and three district chiefs, all of whom are veterans in the service



CHIEF GEORGE A. STEERE, PROVIDENCE, R.I.

and are awake to every improvement for their department. There are fourteen steam fire-engine companies, nearly all of which are equipped with combination chemical and hose wagons, also five separate hose com-

panies, three combination hose and chemical companies, four aerial ladder trucks, and six city hook and ladder companies. A force of three steam fire-engines and one hook and ladder truck is held in reserve. In an area of 18½ square miles there are 427 fire-alarm signal boxes connected to one of the most up-to-date fire-alarm headquarters of recent installation. The fire-alarm headquarters, or "Battery Room" (as it is commonly known), is supplied with the latest and most modern innovations known to the service, and is conducted and operated by the superintendent of fire alarm and his assistants in a highly commendable manner. Unlike most cities, the protective department, which has two wagons, is maintained jointly by the city and insurance companies. The general water service of Providence is excellently maintained, and the



ENGINE 22, PROVIDENCE, R.I.

project of "high-pressure service" is at present receiving a large amount of attention, which indicates that this city will soon add this form of water service to the armament of its fire system. On April 1 of this year Chief Steere will retire, much to the regret of the property owners and the public in general throughout the city. Chief Steere is seventy-three years old, and during his entire service as chief has continually displayed an abundance of rare, resourceful ability. His first service was in the hand-engine days, and, like all other aged firemen who have witnessed many changes brought about by natural progression, he is yet an ardent exponent of the excellent work performed by the firemen who dragged their machine when responding to an alarm. Chief Steere was the first man to hold the office of deputy chief in his city, and this office will be abolished upon his retirement. During all the

years that Mr. Steere has been chief, he has had associated with him Holden O. Hill, deputy chief, who will succeed his former superior in the office of chief. Mr. Hill, who has been a fireman for nearly forty-six years, will also be retired on July 1 of this year. These venerable firemen are among the first to be affected by recent acts which have placed the age limit at sixty-five years, and henceforth all Providence firemen arriving at that age will be retired. The coming retirement of Chief Steere has brought forth beautiful tributes of the esteem and regard in which he is held by all members of his department, and a universal display of the wholesome veneration and endearing sentiments of the community he has for a lifetime served so well. Chief Hill will be succeeded by Mr. Reuben D. Weeks, who for nearly a quarter of a century has been a fireman, and is at present a district chief.

Springfield, Mass., is at present the leading city for automobile fire-wagons. The men, apparatus, and general detail of work are models of what a fire department should be. Although a small city, this department is exceptionally large, with plenty of men and an abundance of apparatus, indicating the esteem and confidence in which it is held by the general public. With a valuation of nearly a hundred millions and an actual property loss of only \$75,000, in



DEPUTY CHIEF HOLDEN O. HILL, PROVIDENCE, R. I.

response to 530 alarms during the year 1908, the speed of Flying Squadrons and their instantaneous start for a scene of action must and will in the future show their full worth as a conveyance of a fire-fighting force. Another striking feature of this department is the drill school. Under the direction of Captain A. H. Strong every man must pass a strict probationary term. Notwithstanding that Springfield has a population of less than ninety thousand and its area is hardly thirty-six square miles, this small municipality maintains and insists upon a rigid drill instruction for all fire department recruits, and the above figures of liabilities and losses stoutly defend the effect of such a technical school. In this department there are a number of ex-members of the United States Army and Navy who are held in high esteem as fire-fighters



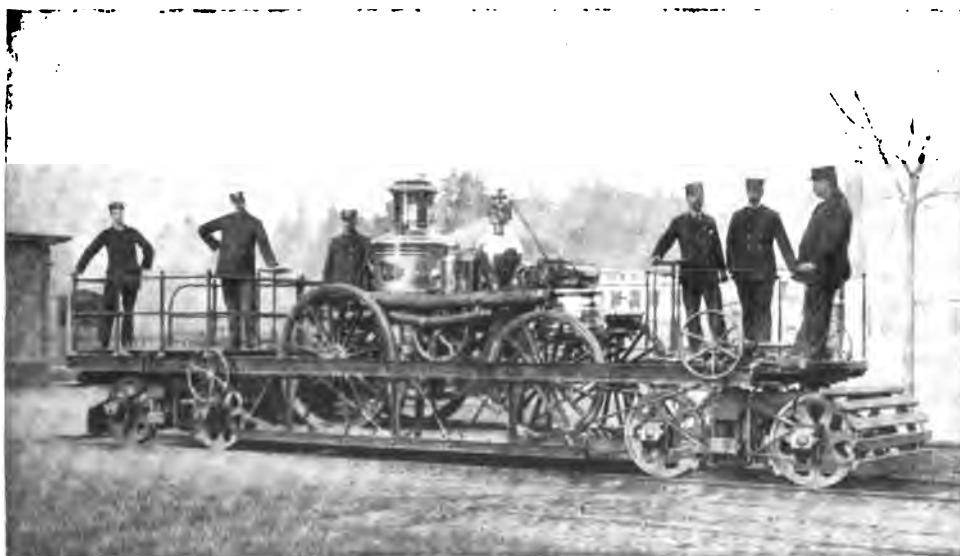
DISTRICT CHIEF REUBEN D. WEEKS, PROVIDENCE, R.I.



FLYING SQUADRON "A," SPRINGFIELD, MASS.



ENGINE 2, SPRINGFIELD, MASS.



TRANSPORTATION CAR, SPRINGFIELD (MASS.) FIRE DEPARTMENT.



**CHIEF WILLIAM H. DAGGETT, SPRINGFIELD, MASS.**



**HOSE 7, COMBINATION HOSE AND CHEMICAL, SPRINGFIELD, MASS.**

both by fire officials and the general public. Many of these men have served the government at the United States Arsenal and Armory, located in Springfield, where they become accustomed to rigid rules. Therefore, when they enter the fire service, they are at once particularly adapted for the strict discipline which pervades throughout, and which officers and men alike recognize and abide by with pride. The department consists of nine steam fire-engines, each having a hose-wagon fitted with chemical tanks; three separate hose companies; two chemical engines; four city hook and ladder trucks; two aerial trucks; one water-tower; fire-alarm wagons, etc.,—all horse-drawn. The automobile force at present consists of two chiefs' autos, two auxiliary squads (Flying Squadrons), and one combination hose and chemical, carrying 1,000 feet of 2½-inch hose and 250 feet of chemical hose, small extinguishers, axes, door-openers, and other appliances. Each "Flying Squad" carries eight men, the chiefs' autos three men, and each is equipped with hand extinguishers, lanterns, axes, etc. Springfield not having an entirely permanent department, the horse-drawn apparatus would often arrive at a fire before the "call" force could reach the field. These "new auto squads" have corrected this fault, inasmuch as they are capable of a speed of forty-five miles an hour, so that now the first alarm brings these squads, with their eight men, the chief and deputy chief in their autos with three men each, making a score of men available in the shortest possible time. Springfield will continue to add auto-constructed apparatus, having full faith in its practical service demonstrations since its addition to the fire-fighting forces. Another feature of the department is a transportation platform car, built to run on street railroad tracks, and equipped to carry a fire-engine with a quantity of hose to a distant city needing assistance. The innovation is decidedly unique and is the only one in use at present. Fire officials are giving this new invention considerable attention and investigation. The horses, apparatus, and fire stations are maintained under an excellent sanitary system, and the officers and men are of the order and class that reflect wholesome credit upon the department and their community. William H. Daggett is chief, and his assistants are E. A. Kimball, B. Steere, and J. R. Graves, respectively, who have in their command about one hundred and seventy men.

Of the many fire departments visited while compiling this work, the writer found conditions in the city of Elmira, N.Y., of a remarkable character. During the last few years the firemen have been compelled to answer many alarms of fire caused from dynamite, powder, gas, and gasoline explosions. Many of these were direct and intentional attempts to wreck the property, presumably for the purpose of defrauding the insurance companies. During the progress of many of these fires a second explosion has occurred, endangering the lives of the firemen. In several instances terrible deaths seemed to be miraculously averted. Although Elmira is classed among the small city fire departments, they have had many exceptionally exciting encounters in flaming struct-

ures, sufficient to try the nerve and skill of the most experienced firemen. The department consists of four steam fire-engines, four combination chemical and hose wagons, one aerial ladder truck, one city ladder truck, one battery wagon, and a reserve force of three steam engines. By a very ingenious device, the invention of the chief engineer, the reserve engines are set in rear of the engines that are ready to respond. A double-heating attachment is so devised that, when an engine leaves the house, automatic attachments shut off the steam supply from the pipes supplying the engine which has left the quarters, and



ENGINE 1, ELMIRA, N.Y.

*At fire of Eastern Leaf Tobacco Co.—Freezing Weather.*

transfer the supply to the reserve engine. Therefore, the water in the boiler of the reserve engine becomes rapidly heated, making the engine ready for instant use, should its services be required. Elmira is one of the first small cities to permanently employ its firemen. There are, however, at the present time but forty men in the entire service. Under the conditions to which this department has been exposed during its many trials of the past few years, the knowledge, coolness, and intrepidity displayed by these men in the performance of their duty give them a prominent rôle among the fearless fire-fighters of the day. The fact that the manual force of this department is exceptionally small (all companies having an insufficient number of men) displays at once their commendable work. A large portion of the efficiency and advancement of this cosy department is due to its present chief, John H. Espey, who

is a graduate of the drill school of the New York City Fire Department. That Chief Espey is a born fire-fighter is at once apparent by the enthusiastic manner in which he enters into and upon all matters pertaining to fire service. The chief is an excellent machinist, as many improvements throughout the fire service show. His skill and tact in governing his department and in handling and subduing the many nerve-racking fires which have taxed the strength of his forces demonstrate the inexhaustible spirit of duty with which he has imbued his subordinates. Chief Espey has been a fireman for nearly a quarter-century and for five years has been in charge of the department. In a larger city, where the duty of the chief of the fire department is conspicuous, Chief Espey, with his recognized and advanced ideas of fire-fighting, would readily rank among the leading fire chiefs. Elmira has a population of a little over forty thousand, and has an area of about ten square miles. Authentic statistics of about two hundred and fifty fire departments give Elmira the smallest manual force and a larger area than any department of comparative size. During the year 1908 this department responded to 235 alarms. The total insurance on property endangered was nearly one million dollars, and the actual property loss was adjusted for \$120,841.13. While this percentage does not appear to be favorable in comparison with the reports of many other departments, it is, nevertheless, under the conditions which existed, a very creditable showing, and emphasizes the ability and readiness of the firemen of that department. The deplorable and dangerous circumstances surrounding many of these incendiary fires seem to have followed this fire department into the present year. On Saturday night, January 9, the firemen were called in response to box 33. Upon arriving, they were confronted with a building in which a fire was raging throughout, and, notwithstanding that the building had been thoroughly saturated with gasoline, a remarkably good "stop" was made. There had been placed near an open stove a keg of gasoline, and about six feet away an iron wash-tub full of gasoline. When the fire, which had been set, reached these, an explosion occurred, thereby spreading the flames in every direction and wrecking the building. Although this was one of the minor attempts to destroy property, it at once conveys the nature of many of the fires with which Elmira has had to contend. In many instances additional explosions have occurred after the firemen were in a building at work. During such trying conditions the strain upon the chief of the department is extremely severe. Elmira is to be congratulated upon having a fireman for a chief who is so thorough, energetic, enthusiastic, and determined in every detail connected with his office. In the midst of these threatening and arduous fires the gentle and self-sacrificing spirit of Chief Espey was fully demonstrated by a sad, crushing bereavement, which invaded his home, yet revealed him faithfully performing the work of a duty-bound public servant with apparent stoicism. Chief Espey is proud of his department, and is held in equal pride by his subordinate officers and men. The work of the Elmira Fire Department

is interesting on account of its excellent record in subduing fires (which from their inception were of uncommon proportion, and also from the fact that all of the companies are inadequately manned), when the financial liability of the city *versus* the present number of firemen expected to protect it from loss is with common justice considered. When municipal acts will grant an additional number of men in keeping with the number of companies maintained, then the fire department of Elmira in all respects will have taken its place as second to none among the smaller cities.

Although for years a growing city, Schenectady, N.Y., did not until a score of years ago recognize the need of an active fire department. About this time events occurred which brought to the minds of a few men the possible outcome of leaving their city any longer without organized fire protection. While it would seem that the general public did not enter the project in a spirited manner, yet the few men who had become interested in the movement would not allow their thoughts and progressive ideas to be dealt with lightly. The beginning of this fire department, while interesting, was also amusing, and demonstrates the sincerity and determination of its founders. An unused building, suitable for the storage of a wagon, was obtained, and immediately a wagon was equipped from a popular subscription collected by the organizers. This wagon was equipped in a very commendable manner, and, when the cry of fire was given, some one with a horse would hasten to this unique fire station, harness his horse to the wagon, and respond. A company which had been organized soon made arrangements for a horse and a driver to remain at the fire-house during the night. To insure as early notification of a fire as possible, the services of the local telephone company were successfully solicited. This company installed a telephone in the fire-house free of charge. The fire company at once caused to be printed conspicuous cards bearing the number of their telephone, and a printed request to at once call that number in case of fire. Such a display of public spirit on the part of these gallant men could not in justice be overlooked, and from this interesting start began the excellent fire department which Schenectady maintains to-day, and which in truth is a model among its class.

Conspicuous among those who did much for the fire protection of the city is Henry R. Yates, who for nearly ten years has been chief, and is a recognized authority on matters pertaining to fire service. Owing to the youthfulness of this department, the stations, apparatus, water service, fire-alarm system, and all their appurtenances are of recent, practical, and modern construction. Schenectady has a population of about seventy-five thousand, scattered over an area of eight square miles. Within its limits there are several large factories particularly susceptible to fire and many dangerous congested localities which constantly require a watchful eye. Through the earnest and well-directed efforts of Chief Yates, with the generous co-operation of the fire commissioners, the fire department has steadily grown to meet the ordinary

demands incumbent upon it. Like many cities in New York State, the fire department of Schenectady is governed by the board of public safety. Commissioners James J. Moffett and Deputy Commissioner Charles E. Palmer, Jr., with Chief Yates, are officials *de facto* of the fire department. The manual force of this department is eighty-six permanent men and 320 volunteers (call force). The volunteers receive their pay from a percentage of the amount of insurance carried on property in the city by insurance companies not incorporated under the laws of New York State. Many of these men are provided with quarters at the various fire stations, and are supplied with finely fitted reception and recreation rooms. Notwithstanding that these men have no regular stated pay, they are nevertheless under the same stringent government as the permanent men. With such a large call force excellent opportunities are offered for the selection of firemen of general ability, when applicants for the permanent force are being considered. The valuation of Schenectady is nearly fifty million dollars. During the year 1908 the department responded to 271 "bell alarms," in addition to a number of telephone and other calls made on the various companies. The property endangered during the above fires amounted to nearly one million dollars, and the actual damage thereto was less than one hundred thousand. The present department consists of one chief, one deputy chief, who are permanent, and two assistant chiefs connected with the call force. There is also a permanent fire marshal who ranks as a deputy chief, and a general force of 406 men, as previously stated. There are two steam and one gasoline fire-engines, each of which is attended with a combination chemical and hose wagon. There are also six separate hose companies and two aerial ladder truck companies. The chief is provided with an automobile, and in addition there are chiefs' wagons, repair and fire-alarm wagons. There are many minor appliances throughout the department evolved from the ingeniousness of the members. Among these is an electrical device which draws the ladder trucks into the house instead of having them backed in by the horses or drawn in by a windlass. Another improvement which helps to assure early notice of a fire in sparsely settled localities is an arrangement installed at the fire-alarm headquarters with a duplicate set of the number of each fire-box in the city. This system is of particular value in localities with few fire-boxes where a great deal of time would be consumed in running to the nearest box. The system overcomes this difficulty. Hence, upon receiving a communication at the headquarters by telephone or otherwise, the proper box number can be given at once on the alarm bells, from that station. Recently a change was made in the manner of exercising the horses, which has not only proved successful, but relieves the various drivers from a certain amount of anxiety. A relief driver with relief horses reports to the various fire-houses at stated intervals. He remains at each house while the regular driver takes his horses to an outlying section where he can give them proper exercise and at the same time be relieved of the possibility of having to respond to an

alarm of fire while away from his station. Chief Yates and his subordinates are wide-awake and constantly "on the job." Every detail of their duty is conducted in a manner to reflect credit upon themselves, to the gratification of the general public. The commissioners and Chief Yates hold their fire department in especial pride, and are generous contributors to its welfare, from personal as well as business motives. Since a boy Chief Yates has been a fireman. He is resourceful, fearless, tactful, and is an exact yet reasonable disciplinarian. The general record of all work performed by this department is

commendable, and displays excellent executive ability. The animated and enthusiastic bearing of Chief Yates seems to be instilled into the entire department. Neat appearance, spotless quarters, and well-kept apparatus are general characteristics which are held in envious yet good-natured rivalry by the various companies. The commissioners were formerly active members of the fire department, and therefore are acquainted with the many details requisite for such a service. This experience, coupled with the excellent ability of Chief Yates, suffices to assure the inhabitants of Schenectady of able fire protection under ordinary circumstances.



CHIEF WILLIAMS, CHARLOTTESVILLE, VA.

Early in the year of 1848 the members of the Washington Hose Company, No. 10, of Philadelphia, elected to its membership Mr. T. J. Williams, then a boy in his teens. Little did Mr. Williams think, when he first donned a red shirt, that there lay ahead of him threescore years, during all of which time he would remain a fireman, the termination of which career the future must yet decide. Mr. Williams remained a member of the Washington Hose Company for about five years, when he moved to Charlottesville, Va. He immediately entered the fire service there, and is to-day its chief engineer. He became chief in 1855, and has therefore served about fifty-four years in that position. He is the oldest service fire chief in the United States, and probably in the world. Although he has seen about fourscore years of life, nearly sixty-five of them as a fireman, Chief Williams is to-day a well-preserved, rugged, and

heartly gentleman, and is handling his department with an intelligent, up-to-date ability. The record possessed by him is exceptionally rare, and therefore interesting and noteworthy. At a recent serious fire, which threatened a large portion of the business section of Charlottesville, the chief overcame the adversary with highly commendable tact and skill. Chief Williams is of a quiet, unassuming nature, and thoroughly beloved by the members of his department and the entire community. In his department there is one Nott steam fire-engine, one hose-wagon, one hook and ladder truck, one combination supply wagon, and one hand-engine which is used in an outlying section. Another steam fire-engine and a combination chemical and hose wagon are about to be added to his department. The fire-alarm system and water supply are adequate, and in excellent working condition. There are about fifty men in the department, all of whom have a special pride in their duty. A modern, two-story, brick fire-house, with latest equipments and appliances, was recently completed. The chief bears a rich reputation among the firemen throughout Virginia, as was recently shown by his election to the office of treasurer of the Virginia State Firemen's Association. Mr. Williams is a pleasant conversationalist, and is brimful of interesting reminiscences, which are amusing as well as instructive. Chief Williams is to be congratulated upon attaining his ripe age after the hardy life he has pursued, and it is hoped that he may yet enjoy many years of health and happiness in the community to whose protection he has given a full life of unbroken service, effort, and endeavor.



CHIEF O'CONNOR, NEW ORLEANS, LA.

The second oldest fire chief in the United States is Thomas O'Connor, of the fire department of New Orleans, La. There is probably no better known chief throughout the country than he. His wise counsel and in-

tuitiveness have many times given rise to new methods which, when adopted, readily proved themselves of real value. Mr. O'Connor is of the old school and every inch a fireman. Although his city is particularly open to serious fires from which advantageous points of attack are few, he has nevertheless, during his forty years as fire chief, governed his department and protected his city in a manner worthy of the highest praise. All matters of interest for the better protection from fire are matters of interest to Chief O'Connor. While thoroughly interested and faithful to the duties of his own city, he is also deeply interested in all enterprising projects in other fire departments. That disastrous fires on many occasions did not gain headway in his city is largely due to his untiring attention to his responsibilities. His strategic tactics have many times turned defeat into victory. Under his guidance the New Orleans Fire Department has grown to be what it is. All appropriations expended by the city for the maintenance of the fire department become at once, under his intelligent and energetic management, a productive investment. Mr. O'Connor has been a fireman for about fifty years, and since January 1, 1869, has held the position of chief. This long experience, added to his recognized natural ability, places his knowledge of fire fighting at a value far above par. Chief O'Connor is one of the capable type of firemen, whose services might well be sought to teach certain corporation, fault-finding office-holders "the difference between a fire department fighting fire where the fire is burning" and "sitting in a mahogany office theoretically fighting the fire after it has been extinguished." Chief O'Connor bears an excellent reputation, and is held in high respect and esteem in his city, and his knowledge and judgment pertaining to fire matters are recognized throughout fire circles of the country. He is a genial, affable host, determined and precise in the performance of his duty, a particularly sympathetic friend, and his accomplishments are many and varied. In his excellent department there are thirty steam fire-engines and hose-wagons, one separate hose company, thirteen chemical engines, eight hook and ladder trucks, two of which are of the aerial type, one water-tower, one fire-boat (the property of the Dock Board), one automobile chemical engine, and one combination chemical and hose wagon. The chief has eight assistants and a uniformed force of 365 men. During the year 1908 the department responded to 741 alarms, and in many instances total losses were averted only through the efficiency of the chief and the persistent manner in which New Orleans firemen enter on all serious tasks. The salvage corps of this city comprises four companies, and is equipped with all appliances necessary to their department. The population is about three hundred and fifty thousand, and the area a little over one hundred and ninety-six square miles. The latter fact will at once convey to all firemen the extremely long runs to which many companies of the New Orleans Fire Department are subjected.

The third oldest fire chief in the United States is James R. Hopkins, "Uncle Jimmie," as he is familiarly known, of the fire department of Somer-

ville, Mass. Although nearly seventy-four years of age, fifty-six years of which he has been a fireman and for over thirty-seven years the chief, he still conducts the affairs of his department with exceptional enterprise and executive business ability. Chief Hopkins began his career as a fireman in 1852, when as a boy he ran as a volunteer, and was later elected a member of



CHIEF JAMES R. HOPKINS, SOMERVILLE, MASS.

Niagara Hand Engine Company No. 3, of East Cambridge, Mass. Upon moving to Somerville, he at once entered the fire service there as a member of the Somerville Hand Engine Company No. 1. In 1869, while Somerville was yet a town, Mr. Hopkins was appointed a member of the board of engineers, and on January 13, 1872, he became chief. Chief Hopkins is exceptionally well

known through his writings and essays, and many praiseworthy and invaluable methods used in the fire service found their origin in his intuitive mind. Gatherings of fire officials and executive men have many times felt the weight and have been impressed by the strength of Chief Hopkins's debates for better fire protection. Many of the present improvements to fire apparatus and the methods of fire extinguishment were prophesied years ago by this venerable chief. The aluminum fire-hat, so universally used to-day, was first suggested by him, and for many years a distinctive-shaped hat made of this material bore his name. Mr. Hopkins is of strong character, firm, sure, and determined in debate, precise and strict in the control of his department, and as cool and fearless a fireman as ever won the name. Somerville is principally a wooden city, yet the small losses by fire are especially praiseworthy, owing to the excellent manner in which Chief Hopkins has divided his apparatus and men, to insure an equal protection to all localities. On the east side of Somerville are located two of the largest pork-packing establishments in the world, which, owing to their readily combustible nature, have many times threatened a large area of Somerville, as well as that portion of Cambridge known as East Cambridge which adjoins. Although many extensive fires have invaded these large plants, they have always been confined to that property. A neighboring associate of Chief Hopkins for fifty years was former Chief Thomas J. Casey, of the Cambridge (Mass.) Fire Department, to whom much credit is due for the efficient, able, and generous assistance given to his worthy brother fireman, Chief Hopkins, when serious fires threatened the property surrounding these large establishments. Ex-chief Casey and Chief Hopkins were comrades on the famous Niagara No. 3 in Cambridge. Their future proved to be singularly similar, inasmuch as both men rose steadily through the various grades of their respective departments until each became chief, which position they held with a brotherly, mutual, helpful spirit for twenty-six years, at which time Chief Casey retired, after a full service of fifty-one years of fire duty. Their service was interrupted only by their enlistment in the army during the Civil War, from which both received an honorable and faithful discharge. Upon the retirement of Chief Casey beautiful demonstrations of the pride, esteem, and value in which he was held were showered upon him by all classes, including the city government, which tendered him a complimentary reception, at which time he was presented with a handsome gold watch and chain and many other valuable gifts, including a life-sized painting of himself in uniform, which now adorns the corridor between the aldermanic and council chambers in the Cambridge City Hall. Chief Hopkins, however, has remained in the service, and the first tap of the fire bell to-day starts him away with the same fulness of fire spirit he has forever possessed.

During the big Boston fire in 1872 Chief Hopkins and a portion of his department performed gallant duty, which secured for them special thanks from the city of Boston. From the Central Fire Station, which has a command-

ing view of the surrounding country, Chief Hopkins watched and saw the apparent proportions which the Chelsea fire of 1908 had gained. He at once instructed a part of his department to respond, and they were well on their way to Chelsea before the request for their assistance had been received. Chief Hopkins personally commanded his forces during that fire, and again demonstrated that old age, if backed by wisdom, experience, and skill, is no barrier to the successful performance of duty of an enterprising fire chief. Chief Hopkins is the only active fire chief who assisted in the organization of the National Association of Fire Engineers at Baltimore, October 20, 1873. He has attended nearly all of the conventions held since that date. Although often urged, he has never aspired to any office in that honorable association, but did, after much persuasion, become vice-president. The chief is one of the most active members in the Massachusetts Fire Chiefs' Club, of which he is president, and is also a member of the Massachusetts State Firemen's Relief Association. He is an interested and ardent member of the Somerville Veteran Firemen's Association, and is still as fond of the "Old Somerville Tub" as ever. He has contributed a number of valuable addresses to all of these associations. Throughout fire circles "Uncle Jimmie" is popular, and this title is challenged only by a recent cognomen, "Bill," forced upon him by his intimates, who notice in their "Uncle" a likeness to President Taft. Every detail of the Somerville Fire Department displays the keen perception, intelligence, and able management of its time-tried, honored chief. The city of Somerville has an area of about four and one-half square miles and a population of about seventy-five thousand. During the year 1908 the fire department responded to 407 alarms of fire. The total property endangered amounted to \$534,770, and the loss thereon was \$64,842. The manual force is 120 men, eighty of whom are call men. The apparatus is as follows: three steam fire-engine companies, three separate hose companies, two chemical and hose companies, two hook and ladder companies, and one chemical engine company.

As a contrast to the long term of service which many firemen have given to their home city, it will be of interest to learn a little of the youngest enrolled American fireman. After a carefully conducted investigation this title is evidently due to Warren Wesley Foye, Jr., of Medford, Mass., who has followed his father's footsteps, and is a member of Hose Company No. 4 of that city. Mr. Foye, Jr., was born August 8, 1892, and became a member of the fire department on July 1, 1909, while yet under seventeen years of age. Both father and son are interested workers in all fire matters, and are held in high esteem in their community. On a recent vacation Mr. Foye, Jr., was the subject of many commendable remarks from firemen in some of our large cities, owing to his youthful appearance. The young man seems sure to advance along the various grades in the fire service, should he remain a fireman. Even at his early age it cannot be said that fire duty is a novelty to him, for the writer had ample opportunity and evidence in abundance to learn that he was well acquainted



WARREN WESLEY FOYE, JR.  
*America's Youngest Fireman.*

with the various duties and the working of the appliances connected with his chosen line of public duty.

Mr. Foye, Sr., has been a fireman for more than a decade, although for many years before entering the regular service he was a willing helper at fires throughout his city.

In relation to appliances intended to subdue fires in their incipient stages the fire department of the District of Columbia is probably better equipped than any other in the world. During the year ending June 30, 1908, 250 fires were overcome by hand extinguishers, and seventy-two fires were subdued by the use of Johnson force pumps, at least one of which

is carried by every company, with a three-gallon supply bucket. In the fire department alone there are about one hundred and fifty hand chemical extinguishers, ranging in capacity from three to six gallons, and there are nine with a capacity of fifteen gallons. Owing to exceptionally stringent laws, nearly all large buildings are generously equipped with extinguishers. The building laws and regulations in regard to schools and places of public amusement excel in many respects, and are a modern example which any city or town might profit by copying. The protection to school buildings is commendable in every detail. Their form of construction is as non-combustible as possible, and fire-escapes and exits are numerous and at advantageous points. In addition each school is equipped with a telephone and a special fire-alarm signal box. Each school building is provided with a number of hand extinguishers, and janitors and teachers are instructed in their use. Fire drills are frequently held, and a system of automatic signals, one for each floor, is being installed to give notice to the teachers of the location of a fire, and thereby assure, as near as possible, the removal of the school children by the nearest and safest exits, and at the same time not interfere with the progress of the firemen upon their arrival. Previous to opening the schools after each vacation all heating appliances, piping, and ventilating stacks are subjected to a thorough inspection. As in nearly every recorded instance of a school-house fire the origin has proven to be from points about the heater or its accessories, the above inspection is

highly appreciated by the mothers and fathers of the District of Columbia. Another praiseworthy method is the manner in which all business sections are guarded every Fourth of July. At various points, firemen are stationed with six-gallon chemical extinguishers, Johnson pumps, buckets of water, long-handled hooks, and axes, with instructions to pay particular attention to large doorways, windows of closed buildings, areaways, alleys, and hallways. By this method, scores of incipient fires are readily extinguished without calling out a force of apparatus, and thereby are eliminated the excitement and dangers subsequent to the ringing of the fire alarm. The regulations governing theatres and small moving-picture resorts are particularly stringent, and these laws are rigidly enforced. All scenery must be treated at regular intervals to a solution of fire-resisting material. Special attention is also paid to the entrances and exits. A force of inspectors visits all places of amusement nearly every day, and any disobedience to the law is brought to immediate justice.

Excellent laws have also been enacted relative to the storage of oils, explosives, and all commodities of a highly inflammable nature. In the office of the fire marshal this matter is a first consideration, and the strict enforcement of the law has greatly diminished the number of fires heretofore arising from improper storage and care of such merchandise. So much attention has been given to this matter, both by business men and fire officials, that serious warehouse and cellar fires, which are always so menacing and threatening, are diminishing, owing to the infrequency of a violation of the law in this respect. The manual force of this department is about four hundred and fifty men. There are twenty steam fire-engine companies, eleven of which have combination



CHIEF F. J. WAGNER  
*Washington, D.C.*

chemical and hose wagons, eight hook and ladder trucks of the aerial type, three chemical engines, one of which is a combination chemical, hook and ladder, and hose. This latter piece of apparatus is equipped with two fifty-gallon chemical tanks, an aggregate of one hundred and seventy-five feet of ladders, and carries twelve hundred feet of regulation 2½-inch fire hose. It is located in the Brightwood section, which is largely residential, and is considered a modern and effective fire-wagon for such a locality. There is also a water-tower of seventy-five feet elevation, and one fire-boat equipped as follows: two monitor pipes throwing streams of 2, 3, 3½, and 4 inches, and 2, 2½, 3, 3½ inches, respectively; four turret pipes throwing from 1 to 2 inch streams; and ten 2½-inch connections for land streams. The boat is a single screw propeller, with a single high-pressure engine and two duplex fire-pumps, each with a displacement

of three thousand gallons of water per minute. In addition to the active force there is a reserve of three steam fire-engines, two hook and ladder trucks, two hose-wagons, and two chemical engines. In connection with the department there is also a wrecking wagon equipped with a crane and windlass and other necessary tools. Adjoining the station of Engine Company 8, on North Carolina Avenue, there is a drill tower eighty-three feet high which has been in service since January, 1903. At this tower new men receive proper training and weekly drills are held for all members of the department. Here firemen are instructed in the use of scaling and Pompier ladders, life lines, life-saving nets, hose, and become accustomed to jumping into the life-nets from various heights. The department has one chief engineer, a deputy chief, three battalion chiefs, a fire marshal and deputy, a superintendent and assistant superintendent, a veterinary surgeon, and a large clerical force, which includes inspectors. The fire-alarm telegraph is of modern equipment, and the water service is excellent. The only thing remaining to give Washington a complete line of attack against fire is the installation of a high-pressure gravity system. This matter is under consideration, and practical demonstrations have been given from a high-pressure hydrant connected to one of the largest water mains, with satisfactory results. With this addition to the fire service it would be many years before any new apparatus would be required (except as replacement) in the capital city. Mr. F. J. Wagner is the present chief engineer, having succeeded the late William T. Belt, who had held the position for a number of years. Under the direction of Chief Wagner the District of Columbia Fire Department is progressing and maintaining the excellence by which it is characterized. The officers and men of the department are cool, alert masters of their undertakings. The fire stations and apparatus are given every attention, and are at all times in excellent working order. Being the leading community of the nation, the fire department of Washington is constantly under observation, not only by the inhabitants, but by thousands of visitors, every month. Every detail of this department is conducted so efficiently, however, that Washington firemen need have no fear of the results of this continued scrutiny. The department in every respect is all that could be expected, as its excellent records will conclusively confirm. The nation can rightly feel proud of its representative fire department.

## CHAPTER X.

Nearly all newspaper accounts of large fires contain the familiar sentence,—“The fire was first discovered by John Doe, who promptly turned in the alarm from the box on the corner.” Then follows the usual statement regarding the promptness with which the fire apparatus responded to the alarm, and the quickness displayed by them in commencing their hazardous work of saving life and property.

Few realize, however, the operation of the fire-alarm telegraph system, or appreciate the skill of the operators in the telegraph bureau at fire headquarters who are responsible for the rapid and accurate handling of the signals which set the fire-fighting arm of the department in motion. The general public only knows that, if the “hook” is pulled in a signal box, the fire-fighting apparatus will commence to arrive on the scene in approximately two minutes. What takes place between the pulling of the “hook” and the start of the various pieces of apparatus from their houses is not generally understood.

The modern fire-alarm telegraph system represents the growth of a little over sixty years. The invention of the commercial telegraph and its introduction by Professor Morse necessarily attracted attention to the feasibility of transmitting warning or emergency signals from distant points. In 1839 the first suggestion of the use of the Morse telegraph for fire-alarm purposes was made by Dr. W. F. Channing, of Boston, a gentleman of high repute and well known in medical and scientific circles.

Having in mind the cumbersome method of sounding alarms of fire in use at the time, it occurred to Dr. Channing that the Morse telegraph could be adapted to the sounding of alarms of fire, and that a great saving in time and in accuracy over then existing means could be made. It may be interesting at this point to make a brief reference to the manner in which alarms of fire were handled at this period. The city was arbitrarily divided into districts, each district having its watch-tower and bell. When any particular watchman discovered a fire in his district or was advised regarding it, he proceeded to sound upon his bell the number of his district. This was repeated by all of the other watch-towers in the city, and the whole community thereby were gradually warned. It is of course apparent that opportunities for delay and error in this crude method of alarm were constantly present.

Apparently, Dr. Channing was not able at once to devise satisfactory means for putting his ideas into practical operation, for it was not until 1845—six years later—that he made public a comprehensive plan. At that time he published an article in the *Boston Advertiser*, in which he proposed that a central

office should be established in some public building, where the battery to operate his system was to be kept and where there was to be a Morse register and a bell for receiving signals. Wires were to pass from this office "over the house-tops successively to every engine-house and fire-bell in the city." In every station thus established, a "Morse register in connection with an alarm bell was to be placed; also a key, by the simple depression of which an appropriate signal would be instantly conveyed to every other station on the circuit."

Dr. Channing at the same time suggested a modification of this plan; namely, having a separate circuit from every station to the central office, so that the "agent" (operator) could send the alarm to any number or to all of the bell stations and engine-houses, as he might desire.

Dr. Channing also added that "by a change in the arrangement of bell stations, and an increase in the machinery, the hammers of the bells could all be disposed so as to strike mechanically on the communication of a galvanic impulse from the central office. The agent (operator) would therefore be enabled, by depressing a single key with his finger at certain intervals, to ring out an alarm defining the position of the fire simultaneously on every church bell in the city."

Dr. Channing thus foreshadowed the electro-mechanical bell-striking machine which is to-day a standard piece of fire-alarm apparatus, where alarms of fire are publicly given. It is interesting to note that in this first plan Dr. Channing did not apparently provide for any street fire-alarm boxes whatever. He merely provided for the sending of signals telegraphically from one watch-tower to another, as well as to the engine-houses, either from the various watch-towers or from a central office. It is thus curious to note that the starting-point of all latter-day alarms of fire—the street signal box—was not the starting-point of the first inventive thought on the subject.

In the winter of 1847 a Mr. L. L. Sadler, who was superintendent of the telegraph line between Boston and New York, was discussing the feasibility of using the Morse telegraph for fire-alarm signalling with a Mr. F. O. J. Smith, who was one of the pioneer capitalists interested with Professor Morse. Mr. Sadler stated that one of his employees who lived at Framingham, Mass.,—a telegraph operator named Moses G. Farmer,—was a very ingenious and capable mechanic, and one who, he thought, could work out the apparatus details necessary to accomplish the purpose. The subject having thereafter been laid before Mr. Farmer, "within a week he had produced an apparatus for striking alarm bells electro-mechanically, based upon the combination of an electro-magnet and the striking mechanism of an old church clock." This first machine of Farmer's is the starting-point of everything that has since been done in that field. This machine received the approval of Mayor Quincy, of Boston, but nothing further came of it at the time.

On June 10, 1851, Dr. Channing was able to secure an appropriation of \$10,000 from the city of Boston for installing a fire-alarm plant. December 29

\$3,000 additional was appropriated. The plan adopted embraced thirty-nine street boxes connected by telegraph circuits with a central office, from which office all signals received from the boxes were sent out over other circuits to the bell-towers and electrically caused to be struck on the bells. The total cost was \$13,000, and became known as the Channing and Farmer System.

The central station was first placed in the belfry of the City Hall, and was connected with a line of telegraph wires extending to New York, where the operator opened and closed the circuit by means of his "key," which resulted in a series of blows on the bells of the city, and according to newspaper reports a false alarm of fire was sounded. Notwithstanding the great personal qualifications and the respected ambition of Dr. Channing, he might have failed, had not Mr. Farmer, with his practical knowledge of electrical science, come to his assistance, and developed and placed upon a practical basis this excellent use of the electric telegraph. The system was formally accepted by the city government of Boston at noon on April 28, 1852. The first regular alarm to be sounded on this system (and thereby the first electric fire alarm sounded in the world, on any accepted and completed system) was for a fire in a building located at the corner of Causeway and Charlestown Streets on April 29, 1852. In May, 1855, "a superintendent of fire alarms" was appointed, also a committee by the City Council with power to alter and change the rules governing the system and to have them printed as City Ordinances. A schedule of fines ranging from \$2 to \$50 was established, to be imposed upon any person who should in any way tamper with or injure the signal boxes, wires, or give a false alarm. On April 28, 1864, the system of fire alarms was so rearranged as to give the immediate location of any box sounded instead of the mere warning that a fire was in a certain district, each box having been given an individual number.

While, as above noted, the city of Boston installed the first electric fire-alarm signalling system, it seems to be established that the authorities of the city of New York were pioneers in this direction, for in November, 1846, the Common Council authorized the introduction of the Morse telegraph into the fire department, and in 1847 Hugh Downing and Royal E. House, at an expense of \$500, set up a line of telegraph for fire-alarm purposes in different parts of the city.

The connection of bell-towers with fire headquarters by telegraph was completed in 1851. Everything done at this time was practically experimental, and was awaiting the development of the practical machinery required to make the system a permanent one. In fact, it was not until 1869 that New York City (having a paid department organized in 1865) abandoned its old watchmen and bell-towers, and took advantage of the "state of the art" then existing, and adopted a regular central office telegraph system and street signal boxes.

It is quite interesting to note that the introduction of the fire-alarm telegraph was met with determined opposition by the firemen themselves instead

of being received with welcome. Fire departments then were volunteer organizations, in a large sense "clubs," and often deeply engaged in politics, and it was quickly seen that the telegraph system would usher in a new era in fire department affairs and tend towards the creation of paid departments.

The first installation in Boston, comprising 16 tower-bell strikers and 45 street signal boxes, was increased during the first two years of its use to cover 195 street boxes. In 1855 Philadelphia followed Boston, installing a similar system, but with some improvements. In 1856 St. Louis contracted for a telegraph system, and Baltimore and New Orleans followed suit in 1860. It will thus be seen that, while New York was a pioneer in the line of experimenting with the Morse telegraph for fire-alarm signalling, the actual introduction of working plants had taken place in a number of other cities before it did in New York.

In 1855 the late John N. Gamewell, of South Carolina, heard Dr. Channing deliver a lecture on the Fire Alarm Telegraph in the Smithsonian Institute in Washington. Soon after he purchased from the Messrs. Channing and Farmer the right to their invention for the Southern States, and in 1859 purchased the patents for the entire country.

Little or nothing was done during the Civil War in the way of improving this form of public service, but in 1866, immediately after the war, the work was again persistently and actively championed by Mr. Gamewell. When Mr. Gamewell took up the business of fire-alarm service, the Boston system was the only one in existence. First by John N. Gamewell & Co., and afterwards through a corporation which later became the present Gamewell Fire Alarm Telegraph Company, the advantages and value, as well as the necessity, of the fire-alarm service were emphatically heralded and forced on the attention of municipal, State, and national authorities. For the first twenty years after the introduction of the Channing and Farmer system in Boston only about twenty cities were provided with fire-alarm apparatus. In 1876 the number of cities and towns equipped numbered seventy-five. From that year until the present time the fire-alarm service has become so universally adopted that it would be hard to find even a small town of over a few thousand inhabitants without such a service.

From official statistics nearly 90 per cent. of the equipment of fire-alarm telegraph was installed and constructed under the Gamewell Company, therefore the history of the fire-alarm telegraph service of the United States and the history of the Gamewell Company have practically been as one since the year 1855.

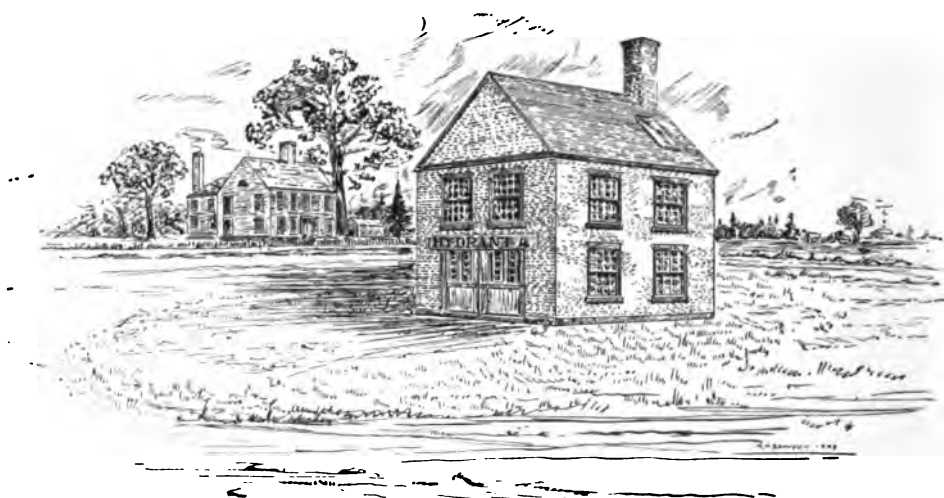
## CHAPTER XI.

The early protection and means of assistance to sufferers from fire are well defined in the following notes from the "History of the Massachusetts Charitable Fire Society":—

"On the twentieth of November, 1792, a few prominent citizens of the town of Boston, moved, as it is said, 'by the frequent examples of suffering and destitution from the ravages of fire, and wishing to lessen the same,' associated themselves together for the purpose of establishing a fund, the income of which was to be applied to 'this humane undertaking.' This association culminated on June 25, 1794, in the incorporation of the society. Its purposes were declared to be to provide means to relieve such of the inhabitants as may suffer by fire, and to stimulate genius to useful discoveries tending to secure lives and property from destruction. The scope of the society was, therefore, purely charitable. It was entirely different from the so-called fire societies, the first of which was formed on the thirtieth of September, 1718, and the purpose of which was declared to be 'for mutual aid in case it should please Almighty God to permit the breaking out of fire in Boston where we live.' When our corporation was formed, there were several of these mutual fire societies in active vitality. The organized service of the members of these societies at fires was essential for the preservation of property as well from theft as from fire. Each member was required to know the watchword, and to keep two buckets, two bags, a bed-key, and a screw-driver at all times handy and in condition for use. The bags, bed-key and screw-driver were to facilitate the removal of the beds and other furniture, the clothing and other valuables, and buckets were used to throw water directly on the fire or to supply the engines. Nothing could be done at a fire without buckets. Hose was not used until after Boston became a city. The first engine, called in those times an 'ingin,' was imported from England and reached Boston in 1678. Its arrival was hailed with great joy, as at that time the crime of arson seems to have been rampant. The value of the work of these engines of the last century may be estimated from an extract from the *News Letter* in 1733: 'There is newly erected in the town of Boston, by Messieurs John and Thomas Hill, a Water Engine at their Still-House by the advise and direction of Mr. Rowland Houghton, drawn by a horse and which delivers a large quantity of water twelve feet above the ground. This being the first of the sort in these parts, we thought taking notice of it might be of public service, inasmuch as a great deal of labor is saved thereby.' It appears from subsequent accounts that this 'tub' did not prove a success. The engine companies were distinct from the fire societies. The volunteer

engine companies turned out for every fire within reach, and among them was an intense spirit of emulation, which sometimes grew into what may be called forceful acerbity. This spirit of emulation was greatly stimulated by the desire to win the premium of five pounds which was given to that engine which succeeded in first throwing water on a building on fire. This premium was first given in 1739, and the practice continued until the paid fire department was established. For water supply in case of fire in those days they had to rely on the nearest pumps or wells.

"A century ago a fire, even though it consumed only a single building, brought terrors which we at the present time can hardly realize. Fire insurance was established in England, but had not gained a foothold in this country. The



A FIRE HOUSE OF A CENTURY AGO.  
*Quarters of Hydrant 4, Hand Engine, Cambridge, Mass.*

amount of accumulated wealth was small. When a man lost his house, it was generally a loss of all he had, and it meant actual privation and suffering for himself and his family. There was crying need for the exercise of charity, but the ability of the people to give in charity was extremely limited. The country had established its independence, but it was overwhelmed with debt. The new-born government had barely strength enough to draw the breath of life. The people were suffering from heavy taxation and a depreciated currency. The exhaustive war with England had terminated only nine years before the first meeting of the founders of the Massachusetts Fire Society.

"Commendable indeed was their spirit when they met under such circumstances to combine with the benevolent intent of helping their unfortunate fellow-man. The watchword was a word agreed upon and changed from time to time, by these early fire companies, and was often required by a sentinel at the door of a burning house. Other early requirements were the frequent



NEWARK, N.J., FIRE STATION, CORNER MULBERRY AND LAFAYETTE STREETS.  
*Quarters of Hook and Ladder Company No. 1, Chemical Engine Company No. 1, and Water Tower Company No. 1. A popular type of a modern fire station.*

sweeping of chimneys, the keeping of a large barrel or hogshead well filled with water near each house, while the carrying of burning coals from house to house was generally prohibited."

In brief, such were the conditions and primitive methods usually adopted until the advent of the hand-engines, hose, and later the steam engines to which we have previously referred. The general public know so little of the inner workings of the present fire department and its apparatus that descriptive account of a modern fire-house to-day should prove interesting as well as instructive. To step from the snug, low-studded, little building that housed the hand-engine into the large, stately edifices of to-day, which in many cases accommodate five or six pieces of modern apparatus, a dozen or more horses, and several companies of twelve or more men each; from the mob of panting yet vociferous men pumping from their "hand-tub" a half-inch stream, vainly splashing against a window or roof twenty or twenty-five feet from the ground, to the latest high-pressure service, sending a five-inch deluge, which with terrific power tears into a building seventy-five or eighty feet high, — is a step full of interesting details.

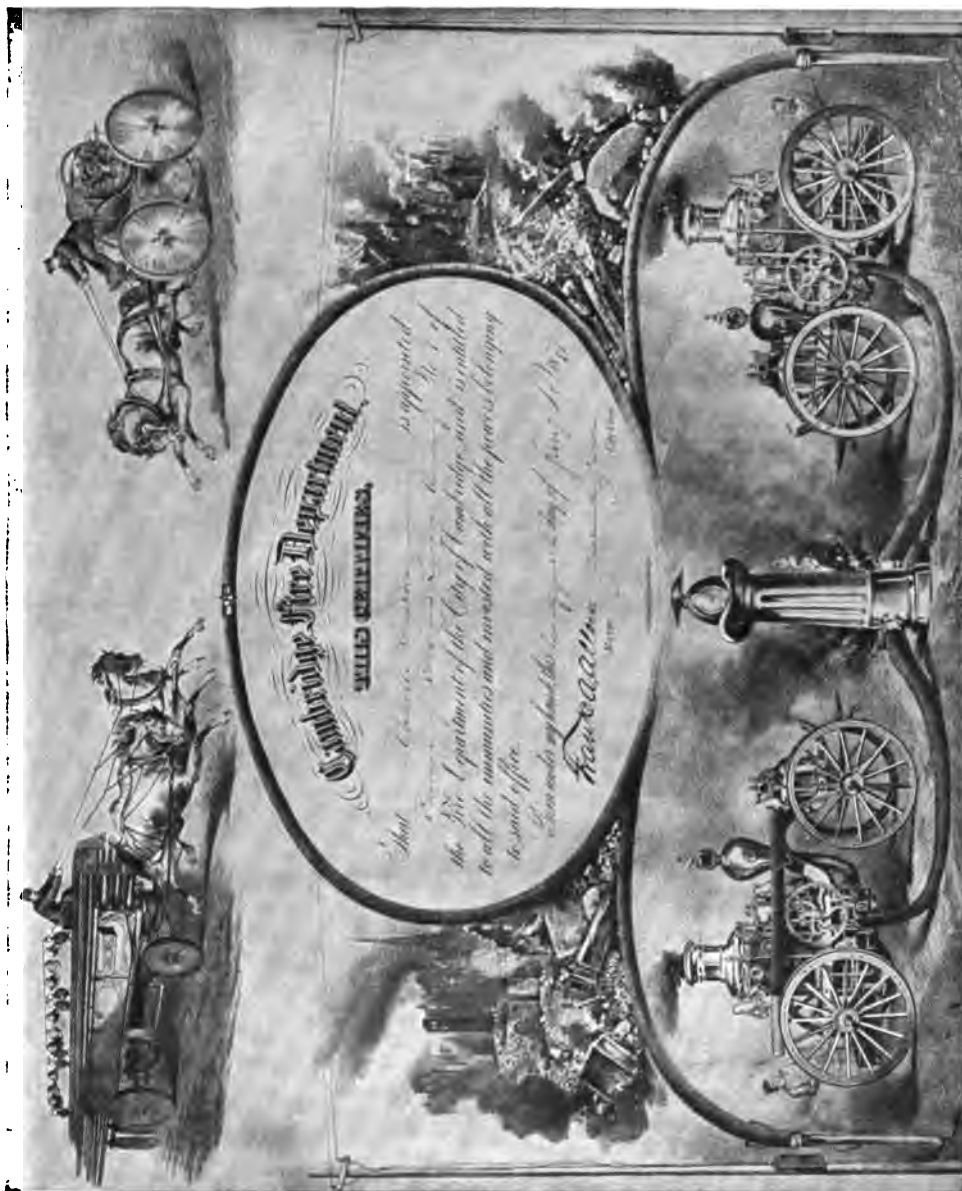
About twelve years ago Chief James R. Hopkins, of Somerville, Mass., one of the oldest, ablest, and most enterprising fire chiefs of the country, read before a large gathering of fire officials and executive men an address intended to promote the protection of Boston and surrounding cities and towns by a system which was heretofore unthought of. In his lofty idea it was plain to note that this venerable chief was looking far ahead, in an endeavor to overcome the possibility of large conflagrations within the district he prescribed. He realized the extensive risks and dangers prevailing in all communities largely of wooden construction. In his address he advised a system of calls, whereby the fire services of the various cities and towns might be connected by a series of alarms, notifying all of the existence of a fire in any of the communities. The value of such a service as Chief Hopkins endeavored to have authorized was demonstrated "too late" by the terrible fire that visited Chelsea in the early part of 1908. Since that fire, however, the Massachusetts Fire Chiefs' Club has taken a firm hold of the project, and placed it in the hands of an intelligent, well-qualified committee, who are rapidly formulating plans which they intend presenting to the legislature for the purpose of enactment. This system will, when completed, give mutual aid to Boston and all surrounding cities and towns within a jurisdiction of about ten miles. The committee owes much of its progress to the interest and assistance given by ex-Commissioner Benjamin W. Wells of the Boston Fire Department, in whose private office many meetings have been held. Mr. Wells, always keenly interested in all fire department matters, entered into the project willingly, and in his office he has topographical drawings of the cities and towns intended to be included under the new system. These drawings show the boundary lines of each community within which is located and numbered each fire-engine house. The

entire idea is of general advantage to all concerned, and it is hoped that this worthy committee will have their admirable efforts accomplished. The following chiefs comprise the committee: James A. Mullen, Boston; James R. Hopkins, Somerville; Nathaniel W. Bunker, Cambridge; Henry A. Spencer, Chelsea; William B. Randlett, Newton.

While such a form of fire service is particularly commendable, and while every movement that would insure its inauguration is earnestly desired, there are, nevertheless, a number of facts which should be taken into consideration in determining the course of such an adventure. There is no time thrown away, no energy too great, no expense wasted, and no suggestions too weak to lay aside or even slight, when considering the value of achieving the system of co-operative or mutual fire service. There are numbers of cities and towns inadequately protected, which, while such conditions remain, are dependent upon and largely at the mercy of their more energetic and enterprising neighbors, who maintain and support fire departments consistent with their liabilities. Shall we refer to these communities with improper protection as unwise, negligent, or that "a scare" is necessary to arouse them? Perhaps they are satisfied with their "embryo department"! If so, are they not selfish or loafers (bearing a contented knowledge that, should a serious emergency arise, ample protection would be speedily offered by their neighbors)? It matters little what explanation is given, since the conditions remain so unequal and unfair. Mutual aid departments, governed by legislative acts requiring each community to be equipped in comparison to its risks and connected by a circuitous series of alarm calls, would tend to reduce the present liabilities, insure an equal protection, and quicken the concentration of a large force in any city or town within a prescribed boundary. In the absence of the necessary laws compelling all fire departments to be equipped in a manner assuring reasonable protection, or in a manner proportionate to the equipment of their neighbors, the unfair conditions would remain as they are at the present time. Another question demanding attention is the inadequate number of firemen permanently employed in many communities. There is another point which has already given rise to considerable discussion. This matter refers to the small pay of the call force in many of the outlying departments. In some of these departments the manual force is almost entirely composed of call men, who are obliged to leave their work whenever the alarm is sounded. In some instances the pay of these men is but about \$100 a year, and the question of calling their company outside of their town limits means that these call men must accompany it, hence they would not know of the existence of a fire occurring in the community to which their apparatus had been called, should they themselves remain in their home town. Therefore, while the firemen of the larger communities are constantly under pay, their brothers from the smaller communities would, in responding to a call beyond their town limits, be deprived of their daily earnings. While such might be termed "unpatriotic," the conditions, however, are known to

exist. With the inauguration of the mutual aid department, every fireman within the proposed boundary would at once become a fireman to the entire area, where previously he was, under ordinary circumstances, a fireman only to his own community. While serious conflagrations are seldom, the question of call men *versus* permanent men is worthy of consideration, inasmuch as the outlying districts are less liable to serious fire than the larger and more central cities, hence the burden of more work and less pay would be, in nearly every case, borne by the call firemen responding from the small communities. Another consideration, indispensable in its character, is the question of the size of hose, hydrants, and engine connections, in order that there would be no delay caused by a collection of various-sized fittings and adjustments. It is to be hoped, however, that these differences will be overcome to the mutual satisfaction of all concerned, whereby Boston and the surrounding suburbs will receive greater protection than at any previous time, and better than any similar area anywhere in the country, thanks to the idea of this excellent, utilitarian development. This practical method of mutual assistance will greatly extend the covering-in system used in Boston and surrounding cities and understood by all firemen. After a certain number of alarms have been sounded in any community for a threatening fire, the apparatus throughout the district will begin to move toward the community endangered. The apparatus nearest the scene will go to the fire, and those not responding directly to the fire will be changed from one station to another, to assure an equal and divided protection throughout the district. Successive alarms would call for similar movements until, if necessary, the entire force of the district would gradually have moved into the danger zone. This plan can be perfected with practically no additional expense, inasmuch as the many fire departments involved, which have heretofore been separated by individual municipal boundaries, will merely become unionized into a grand collective fire-fighting force.

From the beginning of the early organizations of fire companies nearly all cities and towns presented to each member a certificate of membership. Many of these were of original, technical, and handsome design, and were a pictorial story. These certificates were often given annually, inasmuch as most fire companies, until a period of about forty years ago, were appointed every year. For a number of years, however, and with the growing demands in larger communities for a permanent fire service, the custom has been abandoned. Among the most cherished fire relics in the possession of the writer are a number of these early certificates showing the membership of his respected father in the fire department of Cambridge, Mass. One of these certificates, which is here reproduced, will give the reader an excellent idea of one of the first makes of a hand-engine which drafted its own water supply. A certificate bearing the date 1871 has in place of the hand-engine a picture of a steam fire-engine. Shortly after the latter date a much larger and more elaborate certificate was issued,



ONE OF THE LAST CERTIFICATES ISSUED.

CAMBRIDGE FIRE DEPARTMENT.



This

Certifies,

That *Leona P. Lawrence* is appointed  
a Member of Engine Company, No. 3 and of the Fire De-  
partment of the City of Cambridge; and is entitled to all the immunities belonging  
to said office; said appointment to take effect on the 1st day of July 1862.

Given under my hand, this *twelfth* day of *December*, A. D. 1862.

*Chas. H. Russell* Mayor.

*Justin A. Foster* City Clerk.

AN EARLY CERTIFICATE.

and was presented but once, that being when the fireman entered the service. Additional certificates were only given with each promotion to higher office. A reproduction of one of these certificates will also be found here, which was presented to Captain Charles Emerson, who for over forty years has been a fireman and is at present the commanding officer of Engine Company 2.

The writer was fortunate in securing this certificate, inasmuch as Captain Emerson is one of the best-known firemen in New England, and his continuous election to offices of trust in firemen's relief associations and other bodies relating to fire service is worthily significant of the high esteem and confidence in which he is held by his comrades and throughout fire circles in general. On this certificate will be seen one of the first designs of horse-drawn hook and ladder truck with its high box sides, and also an excellent cut of the early pattern of a four-wheeled hose-carriage.

The early hand-engine shown on page 2 is an interesting relic of the old days, and is called "Old Neptune No. 6." It was discovered in the old Barkerville factory by Mr. Corkhill, and evidence of its identity was found in plenty. The machine was originally known as "Neptune Six," "Little Six," and "Bean Soup," and was handled by the Old Neptune Six Company, organized in 1765. This was a bucket company until the engine was built for them. Among the members was John Addoms, who fired the first salute in celebration of the evacuation of New York by the British in 1783. Troy, N.Y., obtained possession of the old machine, and it was used in a suburb of that city, being known as "Hope Six." It was bought from Troy by Charles Barker, of the Barker Woollen Co., Pittsfield. The tub was brightened up some, but nothing was done to mar its appearance of age. Old firemen consider this engine one of the most interesting and valuable fire relics in this country. The Pittsfield Vets would not part with it for its weight in gold. It is now in the relic chamber of the "Crane Art Museum," Pittsfield, Mass.



JOHN CORKHILL.

Following the disuse of the hand-engine, the members of the various companies usually formed themselves into veteran organizations, who many times annually meet at various city and State celebrations "and also at the more prominent annual fairs," at which times they once more, in their red-shirted uniforms, enter into a handsome and interesting parade, to be terminated by a "Muster," as it is termed, where they again test the efficiency of their old machines as well as the endurance of their advancing years.

These individual veteran associations combine through various States into leagues with a set of governing officials who make rules and regulations by which

these "Musters" or "Play Outs" are governed. Among the largest of these leagues is the Connecticut Valley Veteran Firemen's League, of which Mr. John Corkhill, of Pittsfield, Mass., is the present president. It is to President Corkhill that the writer is indebted for permission to reproduce the photo of this interesting relic, "Old Neptune No. 6." As a fireman of the old days, President Corkhill is highly interesting when conversing on the methods of the earlier days, as well as an intelligent speaker on the later and more modern methods of the advanced fire service.

## CONCLUSION.

In compiling these chapters, the writer has had an opportunity to see various forms and workings of fire service. The beginning may well be taken from early boyhood, when, with the ringing of a bell close by, he would run to a fire-house near his home, and with youthful dexterity haul vigorously upon the rope that rung the bell in the Old Union No. 2 Fire-house on Main Street in Cambridge, Mass. The writer well remembers the first opportunity which he had at playing "Real Fireman," when "Jimmie McCabe" allowed him to assist at a coal-wharf fire where Chemical Engine No. 1 of Cambridge was at work. At that time the height of ambition was seemingly obtained when he was allowed the pleasure of riding home on a piece of fire apparatus. Entering the employ of a fire department supply manufactory, further high spirit caused a continuance in the line of fire duty. From Montreal, Canada, to Norfolk, Va., in the position of salesman, the writer many times saw fire service, from the working on a hand-engine to the climbing of aerial ladders. Dragging on the rope of a hand-drawn hook and ladder truck, assisting in the pumping of a hand-engine, driving horse-drawn apparatus while an active fireman, speeding through the streets of many cities in fire automobiles, and riding with chiefs in their buggies,—all assisted in furnishing the material the writer has compiled.

It is very interesting to one acquainted with the fire service to note the various means by which firemen in different cities and towns attack and extinguish their adversary. Local conditions govern the many different ways in which fire departments conduct their work. The endeavors and results of all fire department work are commendable, and in every city or town their individual knowledge of the existing local conditions is, in most cases, the best. Each department is acquainted with its dangerous localities and the possible conditions liable to arise therefrom when "under fire." While one city may have more fire-engines than another city of equal size, this fact does not detract anything from the ability of the latter city. Chemical engines may be extensively used in the first city, where in the second this form of service may be entirely inadequate to meet the building conditions.

The great future question in relation to fire in America will not be the matter of extinguishment, but, rather, a decided movement for its prevention. The losses in America to-day are many millions greater than other nations of much larger area and population. The losses by fire during 1908 reached the enormous sum (estimated) of two hundred and fifty millions to three hundred millions of dollars. Thus the need for care in preventing fire is readily acknowledged by all progressive American fire officials, and to this end the old countries

abroad must, in many ways, be followed in their stringent laws regarding the prevention of fire.

“Fire is a good servant, but a hard master.”

With the establishment of permanent fire departments the pealing of the silver-tongued bell and the loud roar of the fire-whistle have passed away. In bygone years this public warning was necessary to arouse the call-force of firemen, but, upon entering the new era of a regular employed fire department, this warning is not necessary. The firemen, police, and the ambulance corps can at all times perform better service when free from collected crowds of witnesses, whose suggestions and after-criticisms are of little value, generally, in the extinguishment of fire. The quicker that firemen can perform their labor, the better they enjoy it, as is shown by their modest demeanor. Many times in public duty, even though it be of but a short duration, some individuals receive national praise and beautiful gifts; but to such men as Chief Williams of Charlottesville, Va., Chief O'Connor of New Orleans, La., Chief Hopkins of Somerville, Mass., Chief Hosmer of Lowell, Mass., Chief Horton of Baltimore, Md., Chief Steere of Providence, R.I., Chief Horan of Chicago, Ill., Chief Shaughnessy of San Francisco, Cal., Chief Mullen of Boston, Mass., Chief Lane, Manchester, N.H., and Superintendent Groves, New York City, slight credit is generally bestowed, notwithstanding the years of service under varied severe conditions which they have given, to which in many cases they may look back on an honorable record covering over half a century and bearing a trail of defeated sparks.

I have the honor respectfully to express my sincere gratitude to the following for their courteous receptions and generous information:—

Arthur F. Estabrook, Banker, Boston, Mass.  
James A. Mullen, Chief of Fire Department, Boston, Mass.  
John H. Espey, Chief of Fire Department, Elmira, N.Y.  
James C. Baxter, Jr., Chief of Fire Department, Philadelphia, Pa.  
James R. Hopkins, Chief of Fire Department, Somerville, Mass.  
William H. Daggett, Chief of Fire Department, Springfield, Mass.  
William T. Belt, Chief of Fire Department, Washington, D.C.  
George W. Horton, Chief of Fire Department, Baltimore, Md.  
James Horan, Chief of Fire Department, Chicago, Ill.  
John Kenlon, Deputy Chief Fire Department, New York, N.Y.  
P. H. Shaughnessy, Chief of Fire Department, San Francisco, Cal.  
George A. Steere, Chief of Fire Department, Providence, R.I.  
Nathaniel W. Bunker, Chief of Fire Department, Cambridge, Mass.  
David Hennessy, ex-Assistant Chief, Lexington, Mass.  
Benjamin W. Wells, ex-Fire Commissioner, Boston, Mass.  
Edward P. Ferry, Government Stenographer, El Paso, Tex.  
Winsor M. Tyler, M.D., Lexington, Mass.  
Herbert L. Thowless, Attorney, Newark, N.J.  
And also to the *Boston Globe* and *Boston Post* (newspapers).

HERBERT T. JENNESS.











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